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Appendix D to the Research Directorate's Staff Study

History and Organization of the Engineering Profession in Ontario

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APPENDIX D TO THE RESEARCH DIRECTORATE'S

STAFF STUDY

HISTORY AND ORGANIZATION OF THE ENGINEERING PROFESSION

IN ONTARIO

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N O T E

The information contained herein was prepared primarily to provide background for the work of the Professional Organizations Committee, and accordingly describes circumstances as of 1976 (unless otherwise indicated).

I. INTRODUCTION

This document is an attempt to present a general, factual description of the regulatory history and institutional structure of the engineering profession in the Province of Ontario. As such, a major component of this paper consists of an analysis of the roles, powers and structure of the Association of Professional Engineers of Ontario and the many voluntary professional organizations and associations that exist side by side with that regulatory body. Also included in this paper is a general overview of the most important aspects of the regulation of the engineering profession, the university training of engineers, the practice of the profession and its relationship to the regulatory structure, and the discipline of professional engineers.

Much of the information presented in this paper was gathered from documents provided by, and interviews with, officers of the Association of Professional Engineers of Ontario, the various professional organizations and associations described herein, consulting engineering firms and clients of consulting engineers. The Professional Organizations Committee is greatly indebted to these persons and would like to thank all of them for so willingly and energetically giving of their time and experience.

I.1 History of Regulatory Legislation¹

I.1.1 Early Attempts to Enact Regulatory Legislation

At the turn of this century no legislation whatsoever existed to regulate the practice of engineering in Ontario. Any person, no matter what his education, experience, or qualifications, was permitted to hold himself out as an engineer and to do the work that an engineer commonly carried out. Several voluntary associations of persons calling themselves engineers did exist. Generally speaking, these societies served a twofold purpose: firstly, they acted as learned societies which provided technical information to engineers; and secondly, they acted as special interest groups furthering the business and professional interests of engineers. Membership in these organizations, however, did not mean that any particular person holding himself out as an engineer was in fact qualified to practise engineering. Furthermore, no mechanisms existed at the regulatory level for the disciplining of engineers guilty of unethical practices or professional incompetence. An individual's only recourse against an engineer was a civil action in negligence. However, in 1899 a bill was introduced in the Ontario Legislature to incorporate the Canadian Society of Civil Engineers. This first attempt to regulate the practice of professional engineering met with much opposition from mining engineers, and the mining industry in Ontario. After second reading, the Bill was withdrawn from the Ontario Legislature. In 1919, the Engineering Institute of Canada² created a committee consisting of one member from each branch of the Institute. The purpose of this

committee was to formulate a draft bill creating uniform regulatory legislation in each of the provinces. In the same year, the Council of the Engineering Institute of Canada created an Ontario Provincial Division whose purpose was to lead the way to the implementation of a registration law in Ontario. The Ontario Provincial Division decided to pursue this objective in conjunction with several pre-existing engineer-related organizations: The Toronto Section of the American Institute of Electrical Engineers, The Ontario Association of Architects (which later withdrew), The Ontario Section of the American Society of Mechanical Engineers, The Canadian Society of Chemical Industry; The Canadian Institute of Mining and Metallurgy, and The Association of Ontario Land Surveyors (which also later withdrew).

This group of associations created an Advisory Conference Committee as the recognized vehicle for the preparation of draft legislation and the promotion of such legislation in the Ontario Legislature.

I.1.2 The Professional Engineers Act, 1922

The Advisory Conference Committee drafted a bill which, inter alia, required registration with the newly created Association of Professional Engineers of Ontario as a condition precedent to the practice of engineering in Ontario. Due to strong opposition from the mining industry, the Legislature rejected the registration requirement, but otherwise enacted the bill as drafted.

The Professional Engineers Act, S.O. 1922, c.59 created the Association of Professional Engineers of Ontario, and created a Council as the administrative arm of the Association. The Council had the power to control conditions (for example educational requirements) for registration of Ontario engineers. The Act also allowed the Council to set up a system of examinations, as well as a system for disciplining its members. It is important to note that the Act did not make illegal the practice of professional engineering by persons who were not members of the association. The only substantive restriction imposed by the new Act was the requirement of registration in the association or licensing by the association to "take and use the title of 'Registered Professional Engineer'."³ The Act thus was an "open Act." It did not purport to give any one body control of the practice of engineering, but rather gave the APEO control over the use of the term professional engineer, and thus the professional status of professional engineers. In other words, the Act set up a system of "certification" (which regulated use of title), rather than "licensure" (which would have permitted the APEO to regulate the practice of the profession).

I.1.3 The Amendments of 1937: Exclusive Licensure Achieved

The APEO put aside moves to secure licensing power until 1931. In that year the Association decided to seek complete regulatory control over the practice of engineering. The Association hired a "provincial organizer" to marshal support for such a programme

from its members throughout Ontario, from the Engineering Institute of Canada and from other engineering-related groups. In 1932 the Council of the APEO presented amendments to the Act to the Private Bills Committee of the Legislature. The bill once again drew strong opposition from the mining industry, which felt it ought to be able to continue to act free of any regulatory control. The bill was narrowly defeated at the Committee stage.

The Council then went about seeking ways in which to satisfy the objection of the mining interests. In April of 1934 the Council created the Advisory Committee on Legislation, which finally drafted a provision acceptable to the mining community exempting mining prospectors and persons designing mining operations from APEO regulation.⁴ The new bill was presented to the Private Bills Committee of the Legislature, approved by it, and guided through the Legislature, receiving royal assent on March 25, 1937.

The most substantial change in the Act was the addition of one clause to section 33, the penalty section. This section now
5
reads as follows:

Any person in the Province of Ontario, who,
not being registered as a member of the
Association in the Province of Ontario, or
licenced by the Association, -

....

(c) except as provided by section 2 [which
exempts architects, the mining industry
and some others], engages in the practice
of engineering;

shall incur a penalty of not less than \$100.00
nor more than \$200.00 for the first offence,
and of not less than \$200.00 nor more than
\$500.00 for any subsequent offence.

I.1.4 Subsequent "Cosmetic" Changes

The important 1937 amendment in effect "closed" the Act and gave The Association of Professional Engineers of Ontario sole power to control access into and to regulate the practice of engineering in Ontario (viz. granted licensing power to the APEO). There were, however, still some gaps in the legislation. These gaps were filled in by amendments in 1946⁶, 1947⁷, 1949⁸, 1952⁹, and 1954¹⁰. These amendments gave the APEO jurisdiction, inter alia, to provide for a code of ethics (1947), to enforce the code of ethics by means of various sanctions, and to enforce the Act in general. The new amendments also allowed for the first time a corporate entity to practice professional engineering in its own name.

I.1.5 The 1968-69 Amendments

At the instance of the APEO, the first truly substantive amendments to the Act since the first Professional Engineers Act of 1922 were enacted in S.O. 1968-69, c. 99. Generally speaking, the amendments served two important functions. First, they clarified and further refined the regulatory powers of the APEO and its Council. Thus, for the first time the objects of the Association were clearly delineated.¹¹ Significantly, the amendment emphasized that the primary purpose of the self-regulating power is to serve and to protect the public interest. The Council was given jurisdiction to make regulations in respect of its regulatory powers¹² in addition to its power to pass by-laws relating to the internal

administrative and domestic affairs of the Association.¹³ Furthermore, the Act clarified the position of partnerships, associations of persons and corporations practising professional engineering by requiring the issuance of a "certificate of authorization" as a condition precedent¹⁴ to the practice of professional engineering.

The second substantive purpose of the 1968-69 amendment was the procedural modernization of the Act. Many of the procedural safeguards recommended by the McRuer Report¹⁵ with respect to the conduct of hearings where an application for membership is refused¹⁶ and the conduct of disciplinary hearings¹⁷ and appeals therefrom¹⁸ were incorporated into the Act.

II. ROLES, POWERS AND STRUCTURE OF PROFESSIONAL ORGANIZATIONS

II.1 Introduction: Towards a General Classification of Professional Organizations by Function and Interest

In describing the roles, powers and structure of the numerous associations of professional engineers and engineering technicians and technologists, it was felt that it would be useful to frame the discussion within a general classification that grouped the institutional structures of the associations according to classifications relating to the functions of and interests served by the respective associations. It was felt that such an approach would have practical, analytical and theoretical value: practical, in that classification would better enable the reader to understand the workings of the numerous engineering organizations that exist in Ontario and Canada; analytical, in that classification would illustrate more clearly areas of functional commonality between seemingly disparate groups; and theoretical, in that classification would facilitate the development of general theories of the political strategy and institutional behaviour patterns of professional and paraprofessional groups.

The classifications employed herein are as follows:

- Regulatory Body: professional group whose primary function is the regulation of the practice of a profession (or a part thereof) in the public interest by means of prescribing and enforcing entrance standards, standards of knowledge and skill among its members, and standards of professional conduct and competence among its members

- Special Interest Body: professional group whose primary function is the furthering of the business and/or economic interests and/or professional status of its members by means of developing and implementing unified strategies and policies aimed at influencing the decisions of government, regulatory bodies, clients and the public in general
- Technical Body and Learned Society: professional group whose primary function is the promotion, advancement and dissemination of specialized knowledge among its members and for the benefit of the public
- Liaison or Coordinating Body: group of professionals of the same or related disciplines who because of shared interests find it desirable to coordinate policy or transfer knowledge in furtherance of a common goal

It is recognized that in some respects these classifications may be somewhat artificial, for the characteristics of each may overlap at times. Nevertheless, the classifications may be useful if only to demonstrate the extent to which the activities of a given professional body vary from its statutory or self-expressed objectives and obligations.

II.2 Regulatory Bodies

II.2.1 Provincial Regulation: The Association of Professional Engineers of Ontario (APEO)

II.2.1(a) Objects

The Professional Engineers Act, R.S.O. 1970, c. 366 clearly prescribes the objects of the APEO. Section 3(3) provides that:

- The objects of the Association are,
- (a) to regulate the practice of professional engineering and to govern the profession

- in accordance with this Act, the regulations and the by-laws;
- (b) to establish and maintain standards of knowledge and skill among its members; and
 - (c) to establish and maintain standards of professional ethics among its members;
- in order that the public interest be served and protected.

This "objects clause" was incorporated into the Act in the
19
1968-69 amendments. Prior to these amendments, the Association did not possess prescribed statutory objects; rather, the objects were to be inferred from the kind and scope of powers granted to it by statute.

II.2.1(b) Membership

There is one class of membership in the APEO: those persons who are registered as professional engineers pursuant to sections 11 and 12 of The Professional Engineers Act.

Students and assistants to professional engineers who came within the terms of s.13 of The Professional Engineers Act may become registrants. Section 13 provides that:

- (1) Persons who are engaged as assistants to professional engineers in categories recognized by the council and graduates and undergraduates who have not completed the period of engineering experience required by this Act and who contemplate applying for membership on the completion of the period of engineering experience may, upon application in the prescribed form, be recorded in the register but not as members of the Association until fully qualified, and upon being so recorded are subject to the control of the council in accordance with this Act, the regulations and by-laws.

(2) Any registrant whose name is recorded in the register pursuant to subsection 1 may, upon application, have his name deleted from the register.

Persons coming within s.13(1) include university graduates who have not yet completed two years of work experience, students enrolled in undergraduate programmes at universities, and engineering technicians and technologists enrolled in the APEO examination system.

The Association's activities are funded solely by the fees charged to members. Failure to pay fees may result in loss of membership, which would prohibit the person from practising professional engineering in the province. Table II.1 sets out the membership statistics of the APEO from 1967 - 1976 inclusive.

II.2.1(c) Powers of the APEO

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As a corporate body created by an Act of the Provincial Legislature the APEO may only act in law to the extent that it has been empowered to do so by legislation affecting it. The powers and duties of the Association are derived from 5 sources:

- (i) the provisions of The Business Corporations Act, R.S.O. 1970, c.53 which have general application to all bodies corporate;
- (ii) the "objects clause" [s.3(3)] of The Professional Engineers Act which is quoted in full above in Section II.2.1(b);

TABLE II.1

THE ASSOCIATION OF PROFESSIONAL ENGINEERS
OF THE PROVINCE OF ONTARIO

MEMBERSHIP STATISTICS - AS AT 30TH JUNE, 1976

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>
Members on register....	24,449	25,617	27,072	28,870	30,754	31,881	33,245	35,031	37,107	39,081
Net increase	516	677	641	932	866	598	539	724	980	927
New members admitted...	515	694	640	843	751	659	611	782	1,042	934
*Transfers-In.....	118	100	129	146	129	97	113	117	100	118
Re-instatements accepted	69	58	102	55	53	145	54	58	88	108
Transfers-out	26	39	37	14	19	23	18	16	40	43
Resignations accepted..	95	71	106	57	22	221	118	120	89	85
Removed from register due to death	65	65	87	41	26	59	103	96	121	105

"Transfers-In" refers to members of Engineering Associations of other jurisdictions who become members of the APEO.

(iii) section 7(1) of The Professional Engineers Act, which gives the Council power to pass regulations for certain enumerated purposes. (Generally speaking, the power to make regulations relates to the "regulatory functions" of the Council);

(iv) section 8(1) of The Professional Engineers Act, which empowers the Council to pass by-laws for certain enumerated purposes (the power to pass by-laws generally relates to the administrative and domestic affairs of the Association); and

(v) other provisions of the Act which impose specific duties or confer powers on the Association and its Council.

In order to have a clear understanding of the duties and powers of the APEO it may be useful at this juncture to list briefly such duties and powers as they relate to the three objects of the Association enumerated in section 3(3) of the Act. The activities of the Association with respect to the exercise of these powers will be discussed in greater detail in other sections of this paper.

1. To Regulate the Practice of Professional Engineering
[s. 3(3) (a)]

A major form of professional self-regulation is the power granted by the Legislature to determine who shall practise and who shall not practise the profession. The Professional Engineers Act makes it illegal for any person, other than a member or licensee of the APEO to use the title "Professional Engineer", to advertise or hold himself out as a professional engineer, or to engage in the practice of professional engineering. Nor may a firm or corporation

engage in any of these three practices without holding a "certificate of authorization" issued by the APEO. Section 27 of The Professional Engineers Act outlines these offences in the following manner:

27(1) Every person, other than a member or a licensee, who,

- (a) takes and uses orally or otherwise the title "Professional Engineer" or "Registered Professional Engineer" or uses any addition to or abbreviation of either such titles, or any word, name or designation that will lead to the belief that he is a professional engineer, a member or a licensee or, except as permitted by section 2, uses the title or designation "engineer" in such a manner as will lead to the belief that he is a professional engineer, a member or licensee;
- (b) advertises, holds himself out, or conducts himself in any way or by any means as a member or a licensee; or
- (c) engages in the practice of professional engineering is guilty of an offence.

(2) Every person who,

- (a) wilfully procures or attempts to procure registration under this Act for himself or for another person by making, producing or causing to be made or produced any fraudulent representation or declaration either verbal or written; or
- (b) knowingly makes any false statement in any application or declaration signed or filed by him under this Act, is guilty of an offence.

(3) Where a partnership, association of persons or corporation that has no subsisting certificate of authorization,

- (a) practices professional engineering;
- (b) uses orally or otherwise any name, title, description or designation that will lead to the belief that it is entitled to practice professional engineering; or
- (c) advertises, holds itself out or conducts itself in any way or in such manner as to lead to the belief that it is entitled to practise professional engineering,

every member of the partnership, every member of the association of persons, or the corporation and every director thereof, is guilty of an offence.

(4) Where a partnership, association of persons or corporation that has a subsisting certificate of authorization practises professional engineering in contravention of this Act, every member of the partnership, every member of the association of persons, or the corporation and every director thereof, is guilty of an offence.

(5) Every person, member of a partnership, member of an association of persons, and every corporation and director thereof, who is guilty of an offence under this section is on summary conviction liable to a fine of not more than \$1,000 or to imprisonment for a term of not more than six months, or to both.

(6) No proceedings shall be commenced for a contravention of any of the provisions of this section after two years from the date of the commission of such contravention. 1968-69, c. 99, s. 27.

Section 1(i) provides the following statutory definition of the

"practice of professional engineering":

"practice of professional engineering" means the doing of one or more acts of advising on, reporting on, designing of or supervising of the construction of, all public utilities, industrial works, railways, tramways, bridges, tunnels, highways, roads, canals, harbour works, lighthouses, river improvements, wet docks, dry docks, floating docks, dredges, cranes, drainage works, irrigation works, waterworks, water purification plants, sewerage works, sewage disposal works, incinerators, hydraulic works, power transmission systems, steel, concrete or reinforced concrete structures, electric lighting systems, electric power plants, electric machinery, electric or electronic apparatus, electrical or electronic communication systems or equipment, mineral property, mining machinery, mining development, mining operations, gas or oil developments, smelters, refineries, metallurgical machinery, or equipment or apparatus for carrying out such operations, machinery, boilers or their auxiliaries, steam engines, hydraulic turbines, pumps internal combustion engines or other mechanical structures, chemical or metallurgical machinery, apparatus, or processes, or aircraft, and generally all other engineering works including the engineering works and installations relating to airports, airfields or landing strips or relating to town and community planning ...

The "offence provisions" of the Act are clearly the central basis upon which the practice of engineering is controlled. Absent these provisions, any person, no matter what his qualifications, might engage in the practice of engineering without being subject to any regulatory control.

The power of the APEO to regulate the practice of engineering in Ontario is manifested in six ways:

(i) Enforcement of the Act

While no explicit statutory mandate exists which empowers the APEO to initiate prosecution against persons contravening section 27, the prosecution function is implicit in the power of the Association "to regulate the practice of professional Engineering ... in accordance with this Act...". The role of the APEO in the enforcement of the Act is discussed in detail infra, Section V.3.3.

(ii) Membership in the Association

Sections 11, 12 and 13 empower the Council of the APEO to determine the admissibility of an applicant for membership into the Association. Section 8(1) empowers the Council to pass by-laws respecting the registration of members²¹ and for the maintenance of a system of recording the names and addresses of registrants.²² Pursuant to these powers the Council passed By-law No. 2 which prescribes the procedure on application for membership. The requirements for membership in the Association are discussed infra, Section III.2.

(iii) Licensing of Non-Ontario Residents

Section 17 prescribes the rules governing the licensing of non-Ontario residents wishing to practice engineering in Ontario. This

is discussed more fully infra, Section III.4.

(iv) Licensing of Firms

Section 20 empowers the registrar to issue a certificate of authorization to a "partnership, association of persons, or corporation" allowing such an entity to practice engineering in its own name. The licensing of firms is discussed infra, Section III.3.

(v) Hearings Upon Application

The Council shall hold a hearing upon the request of an applicant²³ whose application for membership or licence has been refused.

(vi) Seal

The Act provides that every member and licensee shall have a seal approved by Council and that every drawing involving the practice of engineering shall bear the seal of the professional engineer who²⁴ approved the drawing. The Council has made provision for the contents of the seal in By-law No. 1, s. 93.

2. To Establish and Maintain Standards of Knowledge and Skill Among the APEO Members [s.3(3)(b)]

(i) Establishment of Academic and Experience Qualifications

Sections 11 and 12 empower the Council to define what academic and experience qualifications are required to become a member of the Association. Pursuant to these powers and to sections 8(1)(j) and (1) (which enable the Council to pass by-laws defining the composition and functions of the Board of Examiners and other committees) the Council enacted By-law No. 2 which prescribes the functions and²⁵ composition of the Board of Examiners, the Appeal Board²⁶ and the

Professional Interviewing Committee insofar as these committees relate to the procedure upon application for membership. The Council also may prescribe examinations to be passed as a prerequisite to registration.²⁷ Pursuant to this power the Council enacted O.Reg. 449/69, ss. 1-7 which prescribes the procedure to be followed for APEO examinations. Academic and experience qualifications are discussed more fully infra, Section III.2.2.

(ii) Specialty Designations

The Act empowers the Council to pass regulations with respect to establishing and maintaining a system of designation of specialists.²⁸ Pursuant to this power Council has enacted regulations providing for the designation of specialists through a Board of Specialization²⁹ and the designation of consulting engineers through a Board of Regulations.³⁰

(iii) Incentives to Academic Excellence

The Act empowers the Council to pass by-laws "providing for the establishment of scholarships, bursaries and prizes."³¹

(iv) Continuing Education

The Council may also pass by-laws "providing for services to encourage and assist members in the development of their professional competence and conduct and in carrying on the practice of professional engineering."³²

3. To Establish and Maintain Standards of Professional Ethics [s.3(3)(c)]

(i) Code of Ethics

Section 9 requires the council to prepare and publish a code of ethics.

(ii) Disciplinary Hearings

Section 25 prescribes the procedures to be followed in disciplinary hearings held by the council. The Act also enables council to pass regulations prescribing the practice and procedure for hearings (i.e. those procedures not specifically provided by the Act).³³ Thus the Council passed O.Reg. 111/71, ss. 2-6.

(iii) Professional Misconduct

The Act empowers the Council to make regulations defining "professional
34
misconduct ." Pursuant to this power the Council enacted O.Reg. 449/69, ss. 8&9 defining "professional misconduct." The disciplinary process is dealt with infra, Section VI.

II.2.1(d) Review of the Exercise of Council's Powers

The power of the APEO Council is subject to at least four methods of supervisory control:

(1) All regulations passed by Council are not effective until they are approved by a referendum of APEO members and approved by the Lieutenant Governor in Council [s.7(2)] .

(2) Unlike regulations, by-laws do not require the approval of the Lieutenant Governor in Council. They require, however, the approval of the members of the Association [s.8(3)].

(3) Section 26 of The Professional Engineers Act allows appeals to the Ontario Court of Appeal by any person "whom the council has refused to register for membership or to whom the council has refused to issue a licence or who has been reprimanded or whose membership or licence is suspended or cancelled ..."

(4) The actions of council may also be subject to review on an application for judicial review pursuant to The Judicial Review Procedures Act, S.O. 1971, c.48 Section 8(3) of The Professional Engineers Act provides that "[a]s between a registrant and the Association, the ruling of the council on the construction and interpretation of any by-law is final. In light of The Judicial Review Procedures Act, this section may not preclude an application for judicial review thereunder, for the power to make by-laws comes within the definition of "statutory power" in The Judicial Review Procedures Act, s. 1(g)(i).

II.2.1(e) The Council (The organizational structure of the APEO is represented schematically in Figure II.1.)

The Council of the APEO is the operative adjudicative, administrative and legislative body of the Association, consisting of twenty-three elected and appointed councillors. The functions of the Council have already been discussed. In this section, the composition of the Council will be discussed in some detail. The duties of Council members are delineated in APEO By-law No. 1, ss. 38-42.

(i) General Qualifications of Councillors

All councillors, whether elected or appointed, are required by the Act to be residents of Ontario and Canadian citizens or British subjects (s.4). Every councillor, except the lay and legal councillors must be a member of the APEO.

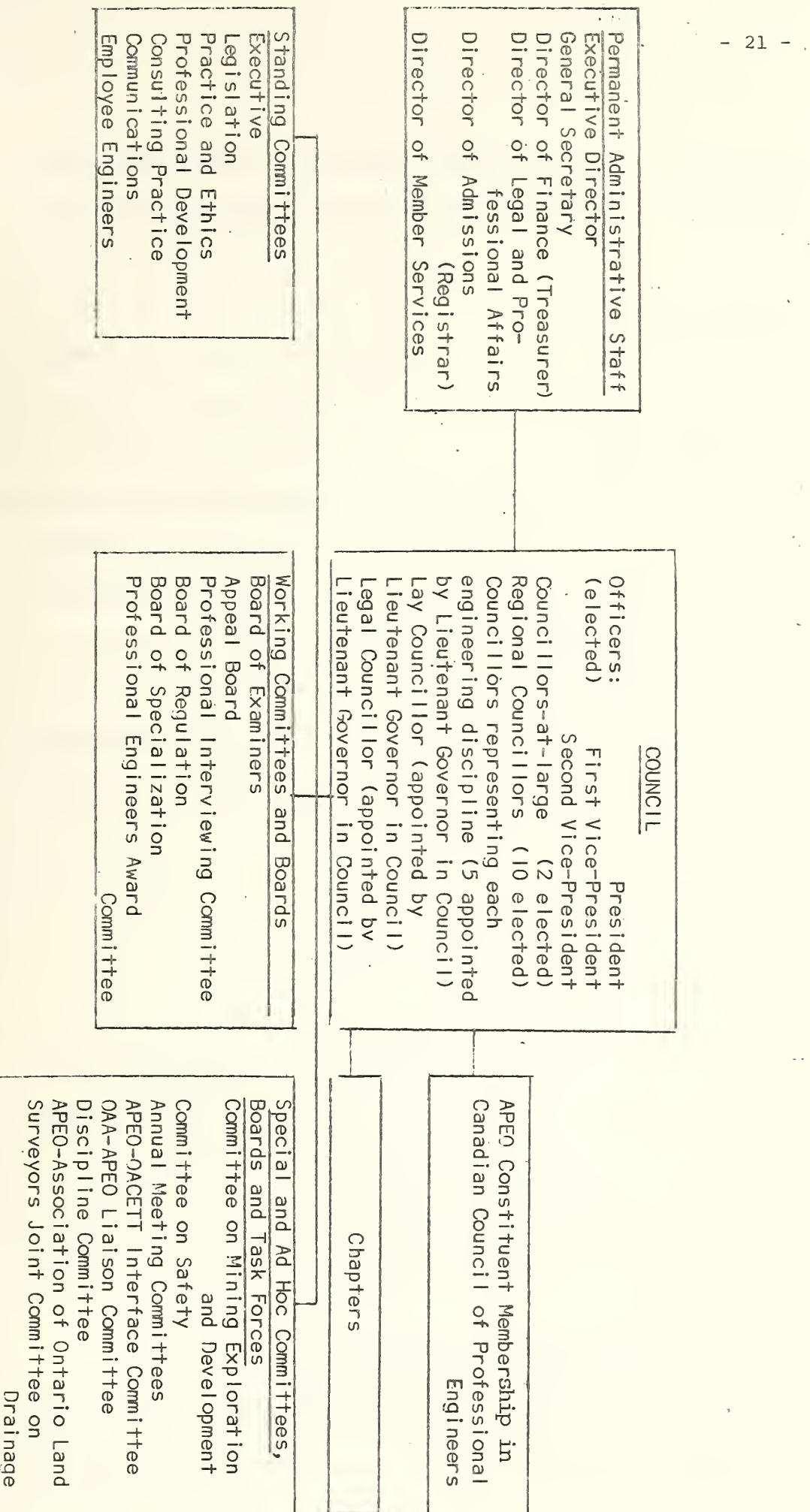
(ii) Elected Councillors

- President, First and Second Vice-Presidents

These three councillors are elected annually by a vote of the members [s.4(2)]. The by-laws of the Association provide that the president

FIGURE II.1

ORGANIZATIONAL STRUCTURE OF THE ASSOCIATION OF PROFESSIONAL ENGINEERS OF ONTARIO



must have served two full years as a member of council and the two vice-presidents one full year prior to their election. (By-law No. 1, s.24).

- Councillors-at-Large

Two councillors-at-large are elected by the members, one each year for a two year term. [s.4(3)].

- Regional Councillors

There are ten regional councillors, two from each of the five regions established by the Council. (See By-law No. 1, ss. 2-4 and Schedule A.) One regional councillor is elected each year for a two year term by a vote of members resident in that region [s.4(4)].

(iii) Appointed Councillors

The Lieutenant Governor in Council appoints five councillors for a term of three years. These five councillors must be qualified respectively in five fields of engineering:³⁵

1. Civil;
2. Mechanical;
3. Electrical;
4. Chemical and Metallurgical;
5. Mining and Geology

In addition to these five government appointees, section 4(6) of the Act empowers the Lieutenant Governor in Council to appoint two additional representatives to Council: one person who is not a member of the APEC, and one person who is a barrister and solicitor of at least ten years standing at the Ontario bar. These latter two appointees serve for a term of three years, but may be eligible for re-appointment [s.4(7)].

(iv) Nomination and Election of Councillors

The procedures for the nomination and election of councillors are prescribed in By-law No. 1, ss.23-36. Of particular importance

is the existence of a nominating committee composed of the penultimate past-president, the president, and two members appointed by Council. The nominating committee nominates persons for election to the offices of the president, the first and second vice-presidents and for councillor-at-large (By-law No. 1, s.26).

II.2.1(f) The Committees of Council

Because of the very extensive duties and powers granted to the Council, it became necessary for Council to create a system of committees. These committees usually consist of one or two members of the Council and three or more appointed members of the APEO. Since the statute imposes mandatory duties on the Council as a whole, the committees in themselves do not have legislative or quasi-judicial powers binding on Council.³⁶ Their function is advisory in nature. However, in the development of Council policy and procedure there is no doubt that the Council places great weight on the recommendations of its committees.

There are three types of committees of Council:

- (i) Standing Committees;
- (ii) Working Committees and Boards; and
- (iii) Special and Ad Hoc Committees, Boards and Task Forces.

The operation of some of these committees will be discussed in detail in this section; others will be described in greater detail in other sections of this paper.

(i) Standing Committees³⁷

Each year the Council appoints seven standing committees. Even though these committees are appointed annually, they are usually activated only upon assignment of a specific task by Council.

1. Executive Committee

By-law No. 1, s.85 provides that:

The Executive shall:

- (a) deal with urgent matters arising between regular meetings of the council;
- (b) consult with other committees of the council;
- (c) act upon or report upon any matters that may be referred to it by the council;
- (d) advise the secretary or any other officer or officials on matters of policy;
- (e) prepare a resume of the year's activities with particular reference to matters of policy as to the outgoing and incoming council;
- (f) make periodic reviews, forecasts, plans and recommendations to the council concerning the future organization and operation of the Association;
- (g) advise the council on all financial matters, including investments, budgets, capital requirements, income, expenditures, salaries, reserves and contingencies or extraordinary expenses, both for current and future operations.

2. Legislation Committee

By-law No. 1, s.86 provides that :

The Legislation Committee shall:

- (a) recommend to the council changes in the Act, the regulations, and the by-laws that may be necessary or advisable;
- (b) inform the council of any proposed legislation that directly or indirectly affects the interests of the Association; and
- (c) when necessary, consult the solicitor of the Association on matters pertaining to legislation.

The Legislation Committee is one of the most important committees of Council. The workings of this committee reflect the fact that the APEO is a regulatory body possessing legislative and quasi-judicial functions delegated to it by the Ontario Legislature. The Association itself has played a very active role in the reform of legislation affecting the practice of

engineering. The process of legislative amendment and the role of the APEO and its Legislation Committee will be discussed in greater detail infra, Section II.2.1(m).

3. Practice and Ethics Committee

By-law No. 1, s.87 provides that:

The Practice and Ethics Committee shall:

- (a) advise the council on all matters referred to it in connection with the practice and ethics of the profession;
- (b) provide for informal investigation of any and all complaints referred to it or of any matter which it considers likely to affect the ethical practice of the profession;
- (c) provide to the council and members advice, assistance and interpretation in matters relating to differences, misunderstandings and alleged breaches of code of ethics; and
- (d) authorize the issuing of letters of warning correction, advice or admonition, with the objective of forestalling or preventing actions or practices which might lead to formal complaints.

The role of this Committee in the discipline of members will be discussed infra, Section VI.

4. Professional Development Committee

By-law No. 1, s.88 provides that:

The Professional Development Committee shall:

- (a) advise the council on the technical and professional development of engineers, and, as directed by the council, co-ordinate the activities of individuals, committees, or chapters within the profession in matters concerning the continued elevation of personal professional standards;
- (b) keep under review changes which may have a bearing upon the development needs of the professional engineer;
- (c) maintain a continuing study of the requirements of the profession and recommend programmes for continuing education in the fields of technical, business and professional education;

- (d) co-ordinate the activities of the Association in all areas of continuing education, providing liaison with engineering schools, with a view to improvement of facilities for continuing education;
- (e) develop and maintain communications with engineering students;
- (f) maintain a watching brief over all areas of continuing education, providing liaison with engineering schools with a view to improvement of opportunities for continuing education; and
- (g) make recommendations to the council on programmes arising out of any of the studies carried out under the guidance of the Committee.

5. Consulting Practice Committee

By-law No. 1, s.89 provides that:

The Consulting Practice Committee shall:

- (a) recommend to the council policies and programmes relative to the affairs of consulting engineers;
- (b) act as a communications link between individual consulting engineers and the council and provide a forum for the interchange of information between consulting engineers; and
- (c) advise the council on matters pertaining to consulting engineering such as:
 - (i) professional practice;
 - (ii) ethics;
 - (iii) legal matters;
 - (iv) fee schedules;
 - (v) forms of agreement;
 - (vi) publicity and public relations;
 - (vii) settlement of disputes;
 - (viii) performance standards.

6. Communications Committee

By-law No. 1, s.90 provides that:

The Communications Committee shall:

- (a) foster effective communications between the council and the individual members of the Association;
- (b) foster effective communications between the engineering profession and the public;
- (c) advise the council as to the best means of accomplishing the foregoing; and

- (d) with the approval of the council, initiate and carry through appropriate communications projects for the accomplishment of the basic objectives.

7. Employee-Engineers Committee

By-law No. 1, s.91 provides that:

The Employee-Engineers Committee shall:

- (a) provide a forum for the discussion of the particular interests of the employed engineer;
- (b) recommend to the council policies and programmes relative to the affairs and the interests of the employed engineer;
- (c) encourage and assist chapter committees which may have similar interests or projects;
- (d) advise the council on matters relating to the practice of professional engineering by employed engineers, such as:
 - (i) technical and professional development;
 - (ii) continuing education;
 - (iii) utilization of technical manpower;
 - (iv) supply and demand for technical manpower;
 - (v) employment relationships and standards;
 - (vi) ethical practices; and
- (e) with the approval of council, undertake studies for the purpose of enlarging the body of knowledge of the foregoing fields.

The history of , and role played by, the Employee-Engineers Committee in the advancement of the economic interests and professional status of salaried professional engineers will be discussed infra, Section II.7.

(ii) Working Committees and Boards

This class of committees is appointed by Council to perform on-going tasks. They are usually re-appointed by Council each year.

1. Board of Examiners - the assessment of educational qualifications of applicants. The Board's function will be discussed in detail infra, Section III.2.

2. Appeal Board - the assessment of experience qualifications of applicants. See Section III.2.

3. Professional Interviewing Committee - assessment of language abilities and non-academic qualifications (for example, evidence of good character). See Section III.2.

4. Board of Regulation - designation of consulting engineers. See Section III.5.

5. Board of Specialization - designation of specialists. See Section III.5.

6. Professional Engineers Awards Committee.

(iii) Special and Ad Hoc Committees,
Boards and Task Forces

Sometimes the Council will appoint a committee to accomplish a specific task. The tenure of membership is usually for the duration of the task; however, on long-term tasks Council may have to make various re-appointments from time to time. The following is a partial list of such committees:

1. Committee on Mining Exploration and Development.
2. Committee on Safety.
3. Annual Meeting Committee.
4. APEO-OACETT Interface Committee - discussion of problems between engineers and technicians and technologists of the Ontario Association of Engineering Technicians and Technologists.

(See infra, Sections II.3.3 and V.3.4.)

5. OAA-APEO Liaison Committee - discussion towards resolving the jurisdictional dispute between

engineers and architects belonging to the Ontario Association of Architects. (See infra Section V.3.3.)

6. Discipline Committee. (The functions of this Committee will be discussed in detail infra, Section VI.)
7. APEO/Association of Ontario Land Surveyors Joint Committee on Drainage (See Appendix B.1(a) for a Report of this joint committee.)

II.2.1(g) Meetings

The rules regarding meetings of Council are found in By-law No. 1, ss. 46-51. Meetings of Council are held four times each year at three month intervals. The rules regarding meetings of the members of the Association are found in By-law No. 1, ss. 52-59. The purpose of the general annual meeting of members is described in s.52 of By-law No. 1:

An annual general meeting of the members of the Association shall be held for the purpose of laying before the members the reports of the council and committees of the Association and of informing members of matters relating to the affairs of the Association and for the purpose of ascertaining the views of the members present at the meeting on such matters, and other general meetings of the members of the Association may be held for the same purposes.

II.2.1(h) Staff Officials of the APEO

The members of council, as the elected representatives of the members of the APEO, have the ultimate statutory authority to make the decisions and formulate the policy affecting the Association. The duties of members of Council are not full-time. Councillors have their regular occupations in addition to their responsibilities to the APEO. However, the APEO has a fairly

large full-time staff. In a strictly theoretical sense, it could be said that the function of the Council is to make policy while the function of the staff is to carry out that policy.

With an organization such as the APEO, in practice the line between legislative policy development and administrative execution is sometimes rather unclear. The staff officials of the APEO play a very important role in the formulation of policy. Because the staff deals with the administration of the Association on a daily basis, Council must necessarily place great weight on the staff's policy recommendations. There are six "executive" members of staff. A brief description of their responsibilities follows:

(i) Executive Director

In a very real sense, the Executive Director is probably the single most powerful administrative officer of the APEO. He is responsible for supervision of the overall functioning of the APEO. Each of the other executive directors of the APEO report directly to the Executive Director. The Executive Director in turn reports directly to the Council.

(ii) General Secretary

The General Secretary's duties are as follows:

- Corporate Secretary and Secretary of the Council;
- Special Advisor to the Executive Director;
- May report directly to Council regarding procedures and practices affecting the functioning of Council of the Association;
- Directs the publishing activities of the Association;

- Directs Awards Programme;
- Administration of Association's official meetings.

(iii) Director of Finance (Treasurer)

- Financial Planning, banking, investments;
- Payroll and employee benefits;
- Members' insurance;
- Government reporting and statistics;
- Office Services;

(iv) Director of Legal and Professional Affairs

- Discipline of members;
- Enforcement of The Professional Engineers Act;
- All legal and legislative aspects of discipline and enforcement;
- Designation of Specialists and Consulting Engineers;
- Professional practice matters, adjudications and professional standards;
- Coördination of the activities of the Legislation, Practice and Ethics, and Consulting Practice Committees;
- Handles inquiries for legal advice or services;
- Liaison with APEO's solicitors.

(v) Director of Admissions (Registrar)

- Registrations;
- Examinations;
- Temporary licences;
- Certificates of authorization;

- Educational liaison;
- Transfers;
- Reinstatements;
- Accreditation.

(vi) Director of Member Services

- Chapter operations;
- Employment advisory service;
- Special interest divisions;
- Continuing education, seminars, professional meetings;
- Salary surveys;
- Student liaison activities;
- Employee engineers committee.

II.2.1(i) Chapters

Every member of the APEO is required to belong to the chapter of the Association which is situated in the area of his residence.

(The general rules governing the organization of chapters may be found in By-law No. 1, ss.5-20.) There exist 42 chapters within the 5 regions throughout the province. The chapters are funded through rebates from members' dues collected by Council. The chapters meet on a regional basis about three times per year. Nominations for the election of regional councillors are made through the chapter system. The chapter system serves several functions:

(1) The chapter system is the principal means by which the Council of the APEO communicates with its members. In addition to direct communication with members, the Council often assembles chapter chairmen to get their opinions on matters of

concern to Council.

(2) The chapters often publish newsletters.

(3) The chapters are urged to report breaches of the Act to Council.

(4) The Council will sometimes utilize the chapters in order to get appropriate members to attend public meetings, prepare 'grass roots' submissions and lobby on certain issues.

(5) The chapters often organize various social functions.

(6) The chapters function as a kind of political training ground, for traditionally most members of Council have come up through the chapter system.

II.2.1(j) Services and Benefits

The APEO provides various services and benefits to its members. Section 8(1) of the Act allows the Council to pass by-laws relating to the internal administration of the APEO, and in particular:

(p) providing for services to encourage and assist members in the development of their professional competence and conduct and in carrying on the practice of professional engineering;

(s) respecting all other things that are deemed necessary or convenient for the attainment of the objects of the Association and the efficient conduct of its business.

By-law No. 1 provides that the Council may approve the payment of all expenses properly incurred in the conduct of the Association's affairs, including

(d) payment of expenses incurred in the conduct of such incidental services to encourage and assist members in the develop-

ment of their professional competence and conduct and in carrying on the practice of professional engineering as are approved by the council and as are consistent with the service and protection of the public interest in accordance with the objects of the Association, including salary surveys and information, employment and career counselling, continuing education, education counselling, consulting practice services, publication of a journal and other material and liaison with government and industry with respect to the foregoing".

Some of the services provided by the Association may be briefly described as follows:

(i) Employment Advisory Service

The terms of reference of, a description of the operations of, and documents pertaining to the Employment Advisory Service (EAS) have been provided by the APEO. Briefly, the EAS assists unemployed members (and sometimes graduate engineers in training) to find jobs. It does so by keeping an inventory of job openings, helping members prepare resumes of experience and education and providing general counselling.

(ii) Salary Survey

Each year the APEO publishes two salary surveys one of which describes average salaries by year and is participated in by all members, and the other of which indicates salaries by level of responsibility as reported by industrial employers of engineers. This information is useful to employee-engineers in determining where they stand in relation to other engineers. This knowledge may no doubt be used in negotiating salaries.

(iii) Legal Advice

In general, members encountering legal problems are not given any legal advice by the Association. There is, however, one exception to this rule. If, in the opinion of the Council, a matter affects the interests of the engineering profession as a whole, the Association may provide legal assistance in order to establish a significant legal precedent. Thus when hundreds of engineers were laid off at the Avro plant, the Association provided legal assistance to its members.

(iv) Publications

1. Each member receives a copy of the Engineering Digest a monthly professional journal which contains an insert prepared by the APEO called the Ontario Digest.
2. Directory of Members
3. Directory of Companies and firms granted certificates of Authorization.
4. The Association plans soon to publish lists of specialists and consultants.

(v) Insurance

In association with the Canadian Council of Professional Engineers, members of the APEO may take advantage of automobile and home insurance, group life, group disability income protection, group extended care, and professional liability insurance.

(vi) Awards

The Association grants various awards and scholarships for academic ability and contribution to the profession.

(vii) Special Interest Divisions

The APEO provides assistance to members of special interest groups within the association to join together to conduct meetings, seminars and other activities to advance their special interests. Thus far, two such groups exist: "Engineers and Education" and "Contracting and Construction Engineers." The former Consulting Engineers Division became independent of the APEO and eventually became a voluntary association known as the Consulting Engineers of Ontario. (The is described in greater detail infra, Section II.3.1

(viii) Seminars

From time to time conventions, conferences and seminars are held to advance the professional development of engineers. These seminars are usually non-technical in nature and deal with such areas as the liability of the engineer in negligence, preparation for retirement, business management, etc. Technical subjects are left to the various technical and learned societies to deal with. There is no on-going system of continuing education provided by the Association.

(ix) Career Information

The APEO provides career information to secondary school students and others through its speakers programme, films and the distribution of various brochures.

II.2.1(k) Relationship Between the APEO and its Members

The only data available which in any way analyses the relationship between the APEO and its members (i.e. with respect to the Association's non-regulatory functions) is the APEO

"1968 Membership Survey." That survey generated information with respect to the following aspects of the relationship between the regulatory body and its membership (page references are to the survey):

- chapter membership (pp. 8-9)
- satisfaction with the APEO (p.9)
- participation and interest in the APEO (p. 10)
- organization of the APEO (p.10)
- the chapter system (pp. 10-11)
- communications within the APEO(pp. 11-12)
- council (p. 12)
- size of fees (pp. 12-13)
- APEO member services (pp. 13-14)
- collective bargaining and the APEO (p. 14-15)
- political, public relations, education and community activities of the APEO (p. 15)

The results of the survey indicate generally that, except with respect to its regulatory functions, the activities of the APEO do not significantly affect (or otherwise intrude on) the daily professional life of the engineer.

II.2.1(1) Representations to Government

Perhaps the most direct way in which the APEO communicates with government is by the presentation of submissions. In general, the submissions which the APEO has made in the past have involved almost every type of matter that affects engineering in Ontario; those matters dealing with the business interests of engineers, and collateral matters indirectly affecting engineers (for example mine safety). The APEO has provided the P.O.C. with the following

briefs and submissions as a representative sample of the areas of concern to the Association during the past few years:

- Submission on the Provisions of Bill C-256 (The Competition Act) to The Federal and Provincial Secretariat, Ontario Department of Treasury and Economics
- Report of the Committee on "Canadian Engineering for Canadian Engineers", submitted to various provincial and federal ministries (dealing with the utilization of non-Canadian engineers and engineering on Canadian projects)
- APEO Brief to the Commission on Post-Secondary Education in Ontario
- Letter to the Chairman of the Commission on Post-Secondary Education in Ontario (responding to the initial recommendations and comments of the Draft Report of the Commission), March 21, 1972.
- APEO Brief to the Royal Commission on the Health and Safety of Workers in Mines, February 5, 1975
- APEO Response to the Report of the Senate Special Committee on Science Policy: Volume II -- Targets and Strategies for the 70's

In addition to the many briefs and submissions which it makes to government, perhaps the most important contact which the APEO maintains with the provincial government is with respect to changes in legislation directly affecting the exercise of its regulatory powers. The Ministry of the Attorney General (which administers, inter alia, The Professional Engineers Act) works closely with the APEO in developing changes to the legislation. The Professional Engineers Act and the problems encountered by the Association in its administration are under constant review by the Council of the APEO and by the Legislation Committee of Council of the APEO. The Legislation Committee may consider changes in the Act, the regulations or the by-laws either upon a direction from Council or upon its own initiative. The process

by which the APEO initiates legislative change includes the following steps:

1. A draft is prepared by the Legislation Committee in conjunction with the advice of the Association's solicitors and is presented to Council.

2. Upon review by Council, the draft is returned to the Legislation Committee for re-working and is then sent back to Council for final approval.

3. Discussions are held with the Attorney General and/or the Deputy Attorney General with a view to reaching agreement with respect to general principles and to ironing out substantive details.

4. Having reworked the proposal in accordance with the discussions held with Ministry officials, the staff of the Association, the Legislation Committee, and the Association's solicitors enter into discussions with the Legislative Counsel of the Provincial Legislative Assembly with respect to the content and form of the proposed legislation.

5. Finally, the draft legislation is presented to the Attorney General; the Attorney General (if he so agrees) will then formally introduce the proposal to the Legislature in bill form.

II.2.2 Quasi-Regulation at the National Level: The Canadian Council of Professional Engineers (CCPE)

II.2.2(a) History

By the middle of the 1930's most provinces had enacted legislation granting self-governing power to a provincial engineering association. Because of the gap created by the fact that constitutionally the regulation of professionals was a matter coming

within the jurisdiction of the provinces, these regulatory bodies felt a need to have some form of coordinating body at the national level. This body would serve two important functions. First, it would act as a representative group at the Federal level, making submissions to the Federal Government with respect to matters (such as immigration and competition policy) affecting the regulation of the practice of engineering across provincial jurisdictions. Second, it would give each of the provincial associations a forum for coordinating their regulatory activities in order to advance the ultimate goal of achieving uniform policies and standards across Canada.

The provincial bodies entered into negotiations with the Engineering Institute of Canada (EIC) in the early 1930's to investigate the possibility of that body becoming their representative at the national level. The EIC however, wished more authority than the provincial regulatory bodies felt they could legally delegate to it. Thus, in 1936 the provincial associations formed the Dominion Council of Professional Engineers. The newly formed Council met only once each year and on the whole was rather ineffectual in advancing the goals for which it was formed. In 1958 it finally moved its headquarters to Ottawa and changed its name to the Canadian Council of Professional Engineers. The CCPE remained unincorporated until, finally, in 1965 it obtained letters patent pursuant to The Companies Act, R.S.C. 1952, c. C-53. Since 1965, the CCPE has become a much more powerful voice for the provincial associations in Ottawa.

II.2.2 (b) Objects of the CCPE

The objects of the CCPE are articulated in the 1965 Letters Patent which incorporated the body. They are:

- "(a) to establish and maintain a bond between the provincial and territorial associations and corporation in Canada and to assist them in:
 - (i) co-ordinating and standardizing their activities.
 - (ii) promoting and maintaining high standards in the engineering profession;
 - (iii) promoting the professional, social and economic welfare of the members of the engineering profession;
 - (iv) promoting a knowledge and appreciation of engineering and of the engineering profession and enhancing the usefulness of the profession to the public;
 - (v) promoting the advancement of engineering and related education;
 - (vi) generally carrying out their various objects and functions;
- (b) to act on behalf of and to present the views of its constituent associations and organizations in matters that are of national or international scope;
- (c) to act in respect of other matters of a Canada-wide nature concerning the engineering profession either alone or together with other bodies;
...
- [Clauses (d), (e) and (f) are omitted. They permit the CCPE to print, publish, distribute and prepare pamphlets, advertisements, journals, papers and other publications pertaining to the engineering profession].
- (g) to affiliate with, join or enter into arrangements or agreements to carry on any undertaking with any society, association or other body having objects similar or comparable to those of the [CCPE] ..." ³⁹

II.2.2(c) Membership

Individual engineers may not become members. Membership in the CCPE is restricted to provincial associations of professional engineers having the power to regulate the practice of engineering within their respective province. (Thus special interest groups and technical and learned societies are excluded from membership in the CCPE.) There are eleven "Constituent Associations" having membership in the CCPE: the Associations of Professional Engineers in the provinces of Alberta, British Columbia, Manitoba, New Brunswick, Newfoundland, Nova Scotia, Ontario, Prince Edward Island and Saskatchewan; the Corporation of Engineers of Quebec, and The Association of Professional Engineers of the Yukon
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Territory. (Only the Northwest Territories does not have a self-regulating professional body.) It should be noted that section 10 of The Professional Engineers Act specifically permits the APEO to participate as a constituent member in the activities of the Canadian Council of Professional Engineers.

II.2.2(d) Funding

The operations of the CCPE are financed solely from funds collected from its Constituent Associations. The dues of each Constituent Association are calculated using a per capita formula based on the number of members of each association. (See CCPE By-law No. 1, s.E37(c).)

II.2.2(e) Organization

The discussion herein of the organization of the CCPE will be fairly brief. For further details, see By-law No. 1 of the CCPE.

1. Board of Directors

In general the business of the CCPE is carried on by its Board of Directors. The Directors are appointed according to section E9 of By-law No. 1. The by-law provides for the existence of an Executive Committee to which most of the duties of the Board may be delegated (See By-law No. 1, s. E23).

2. Officers

There are three officers of the CCPE: The President,⁴¹
President-elect⁴², and General Manager.⁴³

3. Meetings of Members

The by-laws provide for an annual meeting of the member Constituent Associations. The functions served by such meetings are delineated in By-law No. 1, ss. E26-E36.

4. Committees

The CCPE has set up the following committees:

- Canadian Accreditation Board
- Canadian Engineering Manpower Council
- Consulting Practice
- Employee-Engineers
- Engineering Technicians and Technologists Interface
- Insurance
- Professional Liability (Joint Committee with the Association of Consulting Engineers of Canada)
- Science Policy
- Uniform Definition of Engineering
- Nominating

- Permanent Staff Officers
- Criteria
- Procedures
- Recognition of Foreign Universities

5. Activities

The activities of the CCPE reflect the dual purpose for which the association was formed: to act as a political arm of the provincial regulatory bodies at the national level and to assist the provincial bodies in unifying standards across Canada so that the qualifications of a professional engineer will be mobile and portable between the provinces. In the former rôle, the CCPE to some extent acts as a special interest group to advance the professional interest of engineers across Canada, while in the latter role it acts in the regulatory capacity more generally associated with the traditional functions of its Constituent Member Associations.

(i) Canadian Accreditation Board (CAB)

The determination of academic qualifications for the practice of professional engineering is legally the responsibility of the provincial self-regulating bodies. Thus each provincial body ultimately must make its own decision as to the acceptability of each engineering programme. However, in order to increase the quality and uniformity of engineering education across Canada, the provincial professional associations through the auspices of the CCPE created the Canadian Accreditation Board. The objectives and functions of the CAB are detailed in its First Annual Report (January 1975) and will be discussed in more detail in Section III.2.

Briefly, the CAB sends an accreditation team to each university offering courses in engineering. The team assesses the school's programme and makes its findings known to the Board which either accredits or refuses to accredit the programme. While the provincial associations are not bound to accept the CAB's recommendations, in point of fact they generally do accept the CAB's accreditation.

(ii) Canadian Engineering Manpower Council

Some four years ago, the CCPE realized that the manpower situation in Canadian engineering presented a fundamental problem: manpower development in technical fields was unplanned. To correct this situation, the CCPE created the Engineering Manpower Council (EMC) as a semi-independent body operating as an adjunct to the CCPE. Its primary function is to commission studies analysing engineering and technical manpower resources and needs. The terms of reference of the EMC are described in the Constitution as follows:

- 4.1 To serve the manpower resource planners in the profession, governments, educational institutions, and industry by providing on a regular basis, current and topical information on matters of vital concern to those who are involved in the education and training of and to those who need the services of engineers and their supporting staffs.
- 4.2 To act in an advisory capacity to and to assist, government departments and agencies who carry out surveys and studies in the field of engineering manpower.
- 4.3 To carry out on its own behalf or under contract for others special surveys and studies in the field of engineering manpower and related fields.

The membership of the EMC reflects the very wide cross-section of persons and groups interested in engineering technical manpower

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planning:

The Council shall be composed of a Chairman and a Secretary-Treasurer, and one member representing each of the contributing organizations in each of the following categories:

Professional Engineering Associations
Technical or Scientific Engineering Societies
Engineering Faculties or Colleges
Technical Institutes & Equivalent
Provincial Departments of Education
Employers of Engineers and Supporting Staffs

The Council shall also include representatives from the following federal government agencies:

Secretary of State for Science and Technology
Department of Manpower and Immigration
Statistics Canada
National Research Council
Science Council

The results of the work of the EMC have been published in its newsletter, entitled Engineering Manpower News. The following is a listing of the research contained therein:

- Volume 1: Engineering Doctorate Employment in Canada, 1973
- Volume 2: Engineering Doctorate Employment in Canada, 1974
- Volume 3: Registration in Engineering at Canadian Universities, 1974-75
- Volume 4: Engineers Salaries Increase by 12.9%
- Volume 5: Registration in Engineering Technology at Ontario Colleges of Applied Arts and Technology and Ryerson Polytechnical Institute, 1974-1975
- Volume 6: Estimating Corporate Requirements for Engineers
- Volume 7: Registration in Engineering at Canadian Universities, 1975-1976
- Volume 8: Annual Membership Salary Survey, December 1975.

One of the important uses to which this manpower data is put is to aid the Department of Manpower and Immigration in setting quotas on the number of engineer immigrants. In this respect,

the influence of the CCPE on entry of foreign engineers into the profession is rather significant.

II.2.2(f) Submissions to Government

The CCPE is very active in the preparation and presentation of submissions and briefs to the Federal Government. The following submissions are representative of the type of representation that the CCPE has made during the past few years:

- Canada's Immigration Policy, Brief submitted to the Minister of Manpower and Immigration, January 1974
- Brief to the Minister of Consumer and Corporate Affairs, on Bill C-256 -- Competition Act, November, 1971
- Brief to the Canadian Senate Special Committee on Science Policy, January, 1976
- Brief to the Standing Committee on Labour, Manpower and Immigration, on Bill C-183 -- An Act to Amend the Canada Labour Code, May, 1972
- Brief presented to the Committee on Finance, Trade and Economic Affairs on Bill C-2 -- Combines Investigation Act, December 1974

II.3. Special Interest Bodies

II.3.1 The Consulting Profession: Employer Engineers

II.3.1(a) Consulting Engineers of Ontario (CEO)

(i) History

The Consulting Engineers of Ontario is a voluntary association, the primary purpose of which is to further the business interests and professional status of consulting engineers. The history of the CEO is inextricably tied to that of the Association of Consulting Engineers of Canada (ACEC)⁴⁵ and the Association of Professional Engineers of Ontario. In 1925 a group of engineers

in private practice across Canada incorporated the Association of Consulting Engineers of Canada. The ACEC, as we shall see, was a national voluntary association whose purpose was to advance the business interests of its members. From its inception the ACEC was viewed as a vehicle through which consulting engineers might establish an effective lobby to deal primarily with the Federal government. Membership in the ACEC was based upon individual membership of consulting engineering firms organized into Provincial Chapters. During its early history, membership consisted mainly of larger firms having branches in many provinces within Canada. Smaller firms most of whom did not deal extensively with the Federal government but who were more interested in provincial and municipal projects, did not participate to any great extent in the activities of the ACEC.

Following the amendment of the Professional Engineers Act in 1968-69, the APEO established several divisions for the purpose of advancing the "common interests" of segments of its membership. The first division to be formed was the Consulting Engineering Division (CED) of the APEO. Several factors gave rise to the establishment of this special interest group within the APEO. Foremost among these factors was the fact that the ACEC was largely composed of the larger firms whose main interest was in dealing with the Federal Government. When the CED was formed it drew a very large part of its support from the smaller firms and from individual consultants. It did not take consulting engineers in Ontario long to discover that the

Consulting Engineering Division of the APEO was not the most efficient vehicle for the advancement of the special interests of consultants. The APEO took the position that it could not forcefully act to promote these special business interests of consultants insofar as the APEO essentially is a regulatory body whose primary purpose is to protect the public interest. In addition, employee engineer members of the APEO opposed the allocation of funds to advance the interests of employer engineers. Thus in 1973, Ontario Consulting Engineers decided to separate from the APEO. By a majority of votes of the members of the Consulting Engineering Division of the APEO and the Ontario chapter of the Association of Consulting Engineers of Canada, the two groups decided to amalgamate to form the Consulting Engineers of Ontario (CEO). At the same time, the Association of Consulting Engineers of Canada amended its by-laws to permit member organizations associated with, but autonomous of, the ACEC. As a result, the Consulting Engineers of Ontario became a member organization of the Association of Consulting Engineers of Canada. In this way Ontario Consulting Engineers would be able to develop strong and effective representation at both the Federal and Provincial levels.

(ii) Objects

The objectives of the Consulting Engineers of Ontario as stated in its charter are as follows:

1. To assist in promoting satisfactory business relations between the members of the Corporation and their clients.
2. To promote cordial relations between the various consulting engineering firms in Ontario and foster

the interchange of professional management and business experience and information among them.

3. To advance the status and welfare of and to safeguard the interests of the consulting engineer.
4. To further the maintenance of high professional and ethical standards in the consulting engineering profession.⁴⁶

(iii) Membership

There are three classes of membership in the CEO: Members;
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Member Firms; and Affiliates.

Members: This category of membership consists of persons who are in the independent practice of providing consulting engineering services. Two qualifications are required: first, the applicant must be a registered professional engineer who is entitled to use the title of "consulting engineer" pursuant to regulations passed by the Association of Professional Engineers under Section 8 of the Professional Engineers Act (the meaning of the term of art, "consulting engineer", will be discussed in detail infra, Section III.5.5); second, the applicant must not be a member or employee of a partnership or association of persons or an officer, director or employee of a corporation. This latter requirement ensures that only sole practitioner consultants are considered "members". As we shall see below, professional engineers who are employed by a "member" or by a "member firm" are granted affiliate membership in the CEO.

Member Firm: Two qualifications are required to become a member firm of the CEO:

1. the applicant must be a consulting engineering firm

which is managed and whose operating policies are determined by persons the majority of whom are registered professional engineers resident in Ontario; and

2. if the applicant is a corporation, it must have been incorporated in Canada and a majority of its issued and outstanding voting shares must be owned or controlled by resident Canadian citizens.

Affiliate: Affiliate membership is automatically granted to all registered professional engineers who are members, officers, or directors of, or employed by members of, member firms.

The CEO does not keep aggregated data with respect to the number of members, member firms, or affiliates. As of March 31st 1976, 335 out of approximately 700 consulting engineers in Ontario were members of the CEO.

The activities of the CEO are funded exclusively by members and member firms. Affiliates are not required to make any kind of financial contribution. The membership fee collected by the CEO consists of two parts, a portion which is remitted to the Association of Consulting Engineers of Canada and a portion which is retained by the CEO. Once the fee is collected, CEO rebates a portion to the ACEC. The amount of the annual fee is based upon the average number of personnel employed by a member or member firm in the preceding calendar year. (The by-laws with respect to fees and assessment of fees may be found in By-laws, Consulting Engineers of Ontario, Article IV.)

(iv) Organization

1. Board of Directors

The affairs and business of the CEO are managed and controlled by a board of 10 directors. A director must be a registered professional engineer entitled to use the designation of consulting engineer and must be a member or affiliate of the CEO. The Board of Directors is elected by the members of the organization. (The procedures for election of, and the powers and duties of the Board of Directors are contained in Article 5 of the by-laws).

2. Officers

The officers of the CEO are the president, vice-president, treasurer, secretary and executive secretary. The president and vice-president are elected by the Board of Directors from amongst its own members. The treasurer, secretary and executive secretary are appointed by the Board of Directors but need not be members of the Board. The duties of the officers of the organization are contained in Article VI of the by-laws of the organization. It should be noted that the by-laws give the executive secretary the power to manage and direct the business and affairs of the organization on a day to day basis except with respect to matters and duties that by law must be transacted or performed by the Board of Directors or by the members in a general meeting.

3. Committees

The development of policy and the political/business-

interest activities of the CEO take place at the committee level. Insofar as the CEO is a relatively new organization and has not yet completely worked out its internal functioning, the activities of its committees are still at the embryonic stage. To date the CEO has established the following committees:

- Membership
- Finance
- Fee Schedule
- Legislation
- Small Firms
- Market Development and competitive Practices
- Communications
- Professional and Public Relations
- Business Activity and Employee Interests
- Meetings
- IntraProfessional
- Association of Consulting Engineers of
Canada Affairs
- Operations
- Intergovernmental

At present the Intergovernmental Committee consists of 4 liaison sub-committees which communicate with the following Ministries: the Ministry of Transportation and Communications, the Ministry of the Environment, the Ministry of Government Services, and the Ministry of Natural Resources. These Committees informally meet with government officials in order to discuss

such issues as fees, standards of service, safety, provisions of contracts and penalties for non-conformance.

In the areas of Business Activity and Market Development, the CEO has established liaison with the Ministry of Natural Resources, the Ministry of Industry and Tourism, the University of Toronto, the Ontario Research Foundation and the Toronto Transit Commission. The CEO has established a Liaison Commission with the T.T.C. with the view to seeking jointly engineering opportunities overseas. The CEO also hopes to have one of its members appointed to the Board of Directors of the Ontario Research Foundation, which just recently has been granted a Certificate of Authorization by the Association of Professional Engineers of Ontario.

The guideline for the work of the CEO may be found in "Consulting Engineers of Ontario Proposed Committee Organization and Terms of Reference", draft June 2, 1976, page 3.

4. Chapters

Article XIV of the By-laws permits the formation of chapters of the organization. Chapters are formed along geographical boundaries and require the consent of the organization expressed by a resolution of the Board of Directors. Members of chapters remain members of the organization. Each chapter is governed by its own by-laws which are approved by the Board of Directors.

Chapters are financially self-supporting and do not receive funds from the CEO.

The chapter system serves two primary functions. First, it provides a ready means of communication from the organization to its members as well as serving as a means of communication from the members to the organization. Second, chapters sometimes also involve themselves in the localized political activities of the CEO. For example, the Hamilton Chapter of the CEO recently engaged in collecting money for legal services to help defeat a by-law which required an architect's stamp on all building plans. It should be noted, however, that the chapters do not play any direct role in the internal management of the CEO or in the development of "official" CEO policy.

(v) Services and Benefits

1. Publications

The CEO publishes a newsletter several times a year.

2. Education

The various committees of the CEO often hold seminars on the business aspects of delivering consulting engineering services. During the 1975-76 period the CEO held seminars on insurance, professional liability, municipal building by-laws, and overseas work opportunities (sponsored by the Department of Trade and Commerce). The CEO has not yet been involved in organizing continuing education seminars advancing the technical expertise of consultants.

3. Generating Business for Consultants

During the past few years the CEO has invited various government officials to speak to its members with respect to how consultants should go about obtaining work from public-sector clients and how consultants should develop export markets. In addition, the CEO provides informal information to prospective clients of consultants with respect to areas of special expertise of its members.

4. Consulting Engineering Practice

The ACEC has issued a manual, dated January 1976, describing how to carry on a consulting engineering practice.

5. Advice to Student Engineers

Insofar as the emphasis of present day engineering education concentrates on the technical (as opposed to the business) aspects of engineering, the CEO plans to make its members available to universities to advise students about the carrying on of a consulting practice. In this manner, the CEO hopes to provide engineering students with the business skills that are not often taught at university.

6. Educating the Business Sector and the General Public

The CEO plans to operate a Bureau of Public Affairs which would provide experts in various fields of engineering to respond technically to questions raised by reporters in regard to engineering matters or to advise public bodies on technical data when required.

7. Professional Liability Insurance, Group Insurance and Pension Plans

These services are all available to members of the CEO through the CEO's membership in the Association of Consulting

Engineers of Canada.

8. The CEO also plans to offer a comprehensive dental plan for the employees of member firms.

(vi) Political Strategy

In general, the political strategy of the CEO is directed towards advancing the special business interests and professional status of consulting engineers. To this end the political activities of the CEO take place at the provincial level, including regional and municipal levels of government, and at the federal level, if deemed desirable. However, lobbying activities with respect to the development of markets at the national and international level are carried out primarily by the Association of Consulting Engineers of Canada, of which the CEO is a member organization. The political strategy of the CEO encompasses three general activities:

1. Liaison with various government ministries and departments through CEO liaison committees and CEO officers. As we have already seen , liaison is established with governments with respect to developing public sector markets, the acceptance of fee schedules, the terms of standard form government contracts, etc.
2. The Presentation of Submissions and Briefs to Government
The CEO submitted a brief to the Premier of Ontario entitled "Trade, Employment and Technology" on 31 March 1977.
3. The Public Speakers Bureau.

During the next few years, the policy priorities of the CEO seems likely to include the resolution of the

following issues:

1. In-House Engineering Services of Government Departments.
Consultants are very much concerned with the extent to which government departments are increasingly utilizing in-house engineering services to perform engineering functions traditionally performed by consulting engineering firms. The following excerpt from the C.E.O. Newsletter, August, 1976 illustrates some of the activities of the CEO with respect to the resolution of this issue:

A recent occurrence of a municipality, considering the expansion of in-house engineering capability, to the detriment of the consulting community in the area was brought to the attention of the C.E.O. office. Coordinating the efforts of some local members and the office of the President, a Night Letter was dispatched to the Mayor and Council requesting a delay in decision on the proposal, to give us sufficient time to prepare a suitable brief on the matter. We have been informed that the Council considered our appeal, amongst others, and the recommendation for staff increase was not accepted. It was gratifying to learn that our Association played a significant part in bringing this matter to a successful conclusion.

2. The increasing attention to civil liability of professional engineers in today's environment .
3. The engineering-architecture jurisdictional dispute .
4. Increasing the opportunities for mixed professional consortia.

II.3.1(b) Association of Consulting Engineers of Canada (A.C.E.C.)

(i) History

The Association of Consulting Engineers of Canada was incorporated as a Dominion company by letters patent in 1925. The Association was founded in Montreal as a private club consisting of 10 prominent Montreal consulting engineers. Membership was first determined on the basis of individual membership. Later membership was on the basis of firm membership. The A.C.E.C. was formed primarily to promote and safeguard the business interests and professional status of engineers in private practice. It has always been recognized that consulting engineers in practice are not only professionals, but are also business persons. As such, the A.C.E.C. was formed to fill the void left by the provincial regulatory bodies which by law were not capable of acting on behalf of the special business interests of consultants. The A.C.E.C. has concentrated its efforts in three major areas of importance to consulting engineers:

1. To fight against the increasing tendency to use in-house engineering services in government.

2. To ensure that engineering services are compensated for on what is considered a fair basis and are not subject to fee cutting that might be considered to be detrimental to the delivery of adequate engineering services. (The A.C.E.C. at one time did publish a schedule of fees independent of the provincial fee schedules. This practice is no longer carried on by the A.C.E.C. The present policy of the A.C.E.C. is that fees are a matter of provincial jurisdiction and that the applicable provincial fee schedule ought to be the basis on which fees for services are negotiated):

3. To fight the importation of foreign engineering services in situations where Canadian firms have the expertise to perform the services competently. (In this regard the A.C.E.C. encourages the Federal Government and Canadian industry to appoint Canadian consultants as prime consultants in foreign joint ventures in order to achieve the transfer of technological knowledge.)

The primary factor, then that led to the formation of the A.C.E.C. was the necessity for having a special interest group that could sell and promote the engineering services of Canadian consultants to government and industry at the national level.

(ii) Objects

The objects of the A.C.E.C. as stated in its charter are as follows:

To assist in promoting satisfactory business relations between the members of the Association and their clients; to promote cordial relations among the various consulting engineering firms in Canada and foster the interchange of professional, management and business experience and information among them and when necessary to safeguard the interests of the consulting engineer; and to further the maintenance of high professional standards in the consulting engineering profession.⁴⁸

(iii) Membership

There are three classes of membership in the A.C.E.C.: member-organizations; member-firms; and honorary members. Sections 1-7 of the A.C.E.C. By-laws, Article II, prescribe the rules relating to membership in the A.C.E.C.

The Board of Directors of the Association has the full power and discretion to admit or not to admit applicants as members to the A.C.E.C. For example, multi-disciplinary firms not having a

sufficient number of consulting engineers may not be admitted. Nor may firms which have a possible conflict of interest with other consultants be admitted. Contractors per se may not become members; however, if a consulting firm has a construction company as well, it may be admitted if no potential conflict of interest exists. Some members even have architects as partners. This is permitted so long as the majority of ownership is held by consulting engineers.

At present there are five member-organizations belonging to the A.C.E.C.: Association des Ingeniueres-Conseils du Quebec, Consulting Engineers of Ontaric, Consulting Engineers of British Columbia, Nova Scotia Consulting Engineers Association, and Association of Consulting Engineers of Saskatchewan. There are also some 780 member firms out of a possible membership of 1500-1600 consultants in Canada. Almost 50% of these member firms are based in Ontario.

(iv) Organization (Figure II.2, infra, is a schematic Illustration of the A.C.E.C. Organizational Structure)

1. Board of Directors

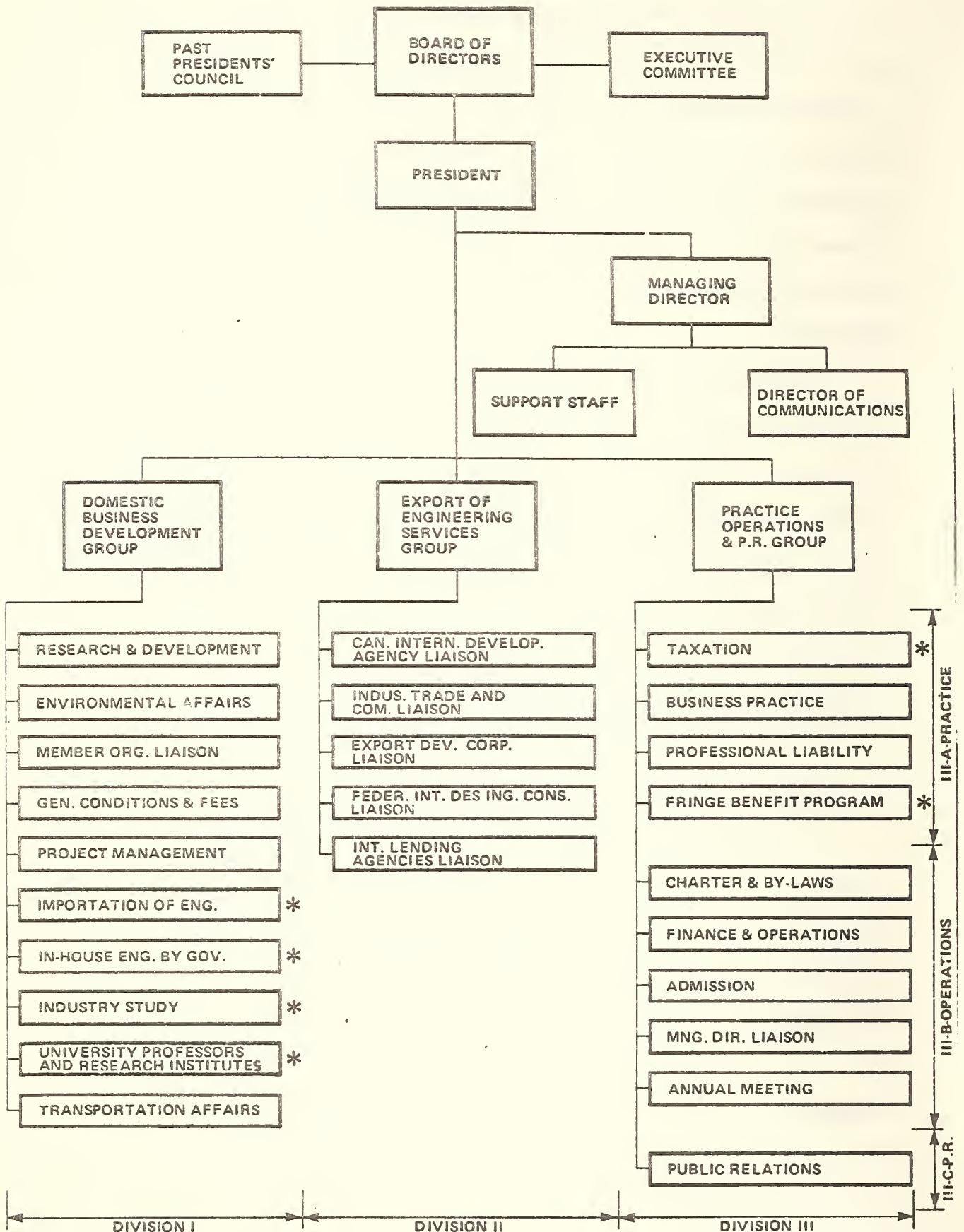
The business and affairs of the A.C.E.C. are managed and controlled by its Board of Directors. The composition, election or appointment, and duties of the Board of Directors may be found in Article IV of the A.C.E.C. by-laws.

2. Officers

The officers of the A.C.E.C. are the President, Vice President, Treasurer, Secretary and Managing Director. The election, appointment and duties of the officers are prescribed in Article VI of the Association by-laws.

Figure II.2

A.C.E.C. ORGANIZATIONAL STRUCTURE



* TASK COMMITTEES (All others are standing)

APPROVED JAN. 26/76
REV. JULY 10/76

3. Committees

The development of short and long-term A.C.E.C. policy and the political activities of the A.C.E.C. are carried on by the Board of Directors; the membership-organizations and the chapters of the A.C.E.C., and the wide-ranging system of committees of the A.C.E.C.. The activities of the A.C.E.C. membership-organizations are outlined in detail in the A.C.E.C. annual report, 1975-76

The Committee structure of the A.C.E.C. is as follows:

(i) Executive Committee

The Executive Committee consists of the President, Vice President, and treasurer of the A.C.E.C.. The Board of Directors from time to time delegates to the Executive Committee power to transact business of the Association in accordance with the established policy and procedures of the Association.

(ii) The Past Presidents' Committee

This body consists of all past Presidents of the Association who have remained in active practice as consulting engineers. The Committee advises the Board of Directors with respect to general policies of the Association.

(iii) Domestic Business Development Committee

This Committee consists of the following sub-committees:

Research and Development - deals primarily with research and development policy, principally with the federal government; represents the views of the member firms of the A.C.E.C. to those federal agencies that develop or influence government research or development policy; deals with the Department of Supply and Services, Science Procurement Secretariat, the Ministry of State, Science and Technology, the

Senate Special Committee on Science Policy, the Science Council of Canada, the Department of Industry, Trade and Commerce, and various groups in the industrial sector such as the Canadian Manufacturers' Association.

Environmental Affairs - organizes conferences in association with representatives of government, industry, the media, citizens groups, biologists, planners, sociologists, lawyers and developers to enable consulting engineers to familiarize themselves with the philosophies and procedures for environmental assessments that are evolving in various Canadian jurisdictions.

Member Organizations Liaison

General Conditions and Fees for Federal Work - liaises with various federal government bodies such as the Department of Public Works and the Treasury Board with respect to government consultant selection policies, adherence to provincial fee schedules, the role of the consulting engineer in project and construction management and other related matters.

Transportation Affairs; Task Committee on Project Management - in response to the organization of the "Advisory Committee on Industrial Benefits From Natural Resource Development," by the Ministry of Indian Affairs and Northern Development, the A.C.E.C. organized a task force to present to the government committee:

... The credentials of the A.C.E.C., describe the abilities of the member firms in engineering and management of large projects, indicate the economic benefits to Canada from major involvements of Canadian engineering firms in resource projects, as well as provide the committee with suggestions as to how Canadian participation in the major resources projects could be maximized.⁴⁹

Task Force on the In-depth Study of the Industry - monitors the results of a Statistics Canada survey of consulting engineering services, 1974 and is considering the establishment of a study analysing Statistics Canada survey information and its economic influence on other sectors of the Canadian economy.

Task Force on University Professors and Research Institutes - deals with the National Council of Deans of Engineering and Applied Science and various government research institutes.

Task Force on the Importation of Engineering - directs its activities towards decreasing the extent of the importation of non-Canadian engineering services by developing associations with foreign firms who are active in the Canadian market, by supporting Federal Government departments' use of Canadian engineering services in research development and by encouraging the use of incentive programs which provide that government funding be tied to a requirement of minimum use of Canadian professional engineering services.

Task Force on In-House Engineering by Government - liaises with the Federal Government with a view to discouraging the increasing utilization of government in-house engineering.

(iv) Export of Engineering Services Committee (EES) -

the term of reference of the Export of Engineering Services Committee are as follows:

The EES Committee shall have as its objective the development of an optimum business climate for the Canadian consulting engineer who is engaged in or wishes to be engaged in professional practice beyond Canada's national boundaries.

It shall attain this objective by:

(a) Direct and continuous contact with all Ministries,

Departments or Agencies of the Federal Government which have a concern with the export of Canada's goods and services.

- (b) Maintaining liaison with any Canadian trade or professional associations which have an interest in the export of Canada's goods and services.
- (c) Periodic liaison with FIDIC [which is the International Association of Consulting Engineers] and its member associations or export matters.
- (d) Maintaining contact with international lending agencies and development banks. 50

The Committee has five sub-committees:

Canadian International Development Agency Liaison
Department of Industry, Trade and Commerce Liaison
Export Development Corporation Liaison
FIDIC Liaison
International Lending Agencies Liaison

The activities of the Export of Engineering Services Committee

during the past year are found in the Annual Report of the Committee.⁵¹

(v) Practice Operations and Public Relations Committee

This Committee consists of the following sub-committees:

Task Force on Taxation
Business Practice
Professional Liability
Fringe Benefit Program
Charter and By-laws
Finance and Operations
Admission
Managing Director Liaison
Annual Meeting
Public Relations

4. Member Organizations and Chapters

The political and business activities of the A.C.E.C. at the provincial level are carried out by its member organizations and by its chapters (in provinces in which no member organization exists). In Ontario, these activities are delegated to the Consulting Engineers of Ontario. A more detailed indication of the activities of the A.C.E.C. Committees and member organizations is given in the A.C.E.C. annual report, 1975-1976.⁵²

(v) Services and Benefits

1. Special Interest Voice

The A.C.E.C. regards its role in influencing legislation and governmental policy as a service and benefit to its members.

2. The A.C.E.C. Directory of Consulting Engineers

The A.C.E.C. publishes a directory containing information on its members' history, personnel, services provided and experience. These directories are distributed to clients of consulting engineers in both the private and public sectors.

3. A.C.E.C. Manual of Practice

The A.C.E.C. has recently developed a practice manual known as "The Practice of Consulting Engineering." This manual advises consulting engineering firms of the most efficient manner in which to carry on a professional practice.

4. Fringe Benefit Program

The A.C.E.C. has developed a group fringe benefit programme for engineers and their employees. The programmes, which are administered by outside agencies, include group disability and life insurance, a retirement savings plan, a pension plan, and a medical-dental plan.

5. Legal Advice

The A.C.E.C. frequently publishes reports to its members with respect to the interpretation of statutes, recent jurisprudence and other legal aspects of the practice of consulting engineering.

6. Workshops and Seminars

The A.C.E.C. has sponsored various workshops and seminars across the country, dealing with such aspects of the practice of engineering as professional liability, cost accounting, bookkeeping, environmental affairs, the export of consulting engineering services and other non-technical aspects of the profession.

7. Foreign Missions

The A.C.E.C. has undertaken several foreign missions to promote Canadian consulting engineering services abroad.

8. Membership in the International Federation of Consulting Engineers (FIDIC)

The A.C.E.C. belongs to the International Federation of Consulting Engineers (FIDIC) which promotes the use of consulting engineering services on a worldwide basis, prepares standard documentation for international contracts, and engages in the exchange of information and technological knowledge. These activities may be of some benefit to Canadian consultants seeking to expand their export markets.

9. Standard Form Contracts

The A.C.E.C. has been active in attempting to standardize contract documents across Canada. Thus the A.C.E.C. has developed standard form contracts for engineering services with architects, developers and various government agencies such as the Canadian

International Development Agency.

10. Newsletter

The A.C.E.C. publishes an Association newsletter which informs its membership of the activities of the A.C.E.C..

(vi) Public Representation

As we have already seen, the A.C.E.C. takes a two-pronged approach to influencing governmental policy and legislation: at the federal level, A.C.E.C. committees and association officers liaise with federal government ministries, departments and officials on a regular basis; at the provincial level, the member organizations and chapters carry out the same function. During the past year the A.C.E.C. has prepared and submitted several briefs and reports. Among these were:

- Supplementary Brief on the Taxation of Foreign-Sourced Income: submitted to the Department of Finance.
- The Role of Consulting Engineers in Canada's Future: Presented to the Ministry of Science and Technology and to the Senate Committee on Science Policy for Canada.
- Canadian Engineering and Project Management in Hydrocarbon Related Projects: Submitted to the Inter-Departmental Committee on Industrial Benefits from Canada's Resources Development, and to Cabinet Ministers.
- Briefs on Anti-Inflation Act and Regulations: Submitted to the Minister of Finance.
- Contract Award for New Uranium Refinery by Eldorado Nuclear Limited: Submitted to the Prime Minister, the Ministers of Indian and Northern Affairs, Energy Mines and Resources, Science and Technology, Public Works, and to the Treasury Board.

- Brief on Bill C-2, An Act to Amend the Combines Investigation Act: Presented to the Committee on Finance, Trade and Economic Affairs.

II.3.1(c) Ontario Consulting Structural Engineers Association (OCSEA)

The Ontario Consulting Structural Engineers Association is a small and (now) inactive information group of about 35-40 structural engineers in private practice. The Association, which was formed about ten years ago, is not incorporated and therefore has no legal status. Nor does it have a constitution or by-laws. The Association was formed out of the concern of some consulting structural engineers over the extensive incidence of fee-cutting that had been taking place in the structural design of apartment buildings. The professed aim of the group is the prevention of fee cutting, on the grounds that this practice necessarily lowers standards. The Association has been putting pressure on the APEO to enforce its schedule of fees and/or to publish more detailed performance standards than the ones now in existence. In this latter regard, the Association is of the opinion that if the APEO were to publish minimum standards of quality, the incidence of fee cutting would diminish. To date the OCSEA has been unable to persuade the APEO to follow its suggestions. As a result, the group published its own fee schedule differing from the APEO's fee schedule; the Association, however, has been unsuccessful in enforcing the fee schedule even amongst its own members.

II.3.2 Employee-Engineers

II.3.3(a) Federation of Engineering and Scientific Associations (FESA)

The Federation of Engineering and Scientific Associations is a federation of employee-engineer bargaining groups throughout

Canada. The aims and objectives of FESA as stated in Article II of its Constitution are as follows:

- a) to promote programmes for the material well-being of its members;
- b) to provide research, standards and support for professional employee groups in the employment relations field;
- c) to set and review standards of salaries, benefits and employment conditions for its members;
- d) to provide a national representative voice for Engineers and related Scientists;
- e) to provide or encourage the provision of group welfare services.

FESA's history is inextricably tied to the history of collective bargaining by professional engineers in Ontario. As such, the historical factors which led to its development will be presented in greater detail below in Section II.7, Collective Bargaining and Professional Engineers. It should be noted here, however, that FESA was formed in 1972 as a direct result of the unsuccessful attempt of groups of employee-engineers (the Hydro group in particular) to take over the Council of the APEO and re-direct the APEO towards a more active support of employee-engineer activities and goals, including formal endorsement and support for the principle of collective bargaining by employee engineers. As we shall see, the formation of FESA is partly a result of the APEO's attempt to absorb militant employee-engineer groups into its Employee-Members Committee and later its Employee Engineers Committee.

In general, membership in FESA is granted to groups and associations of professional engineers and related scientists whose primary purpose is the advancement of the economic and professional

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DATE October, 1975

interest of employee professionals. A group must have at least a majority of professional engineer members before it is eligible for membership in FESA. Table II.2 describes the thirteen member associations and groups that were members of FESA as of October, 1975. It is important to note that almost 80 per cent of the membership of FESA's member groups are registered members of the APEO. Insofar as the primary purpose for which FESA was formed is the promotion of collective action by employee-engineers in order to enhance their economic status and their status as professionals, FESA is very much opposed to the inclusion of paraprofessionals in formal or informal bargaining units of professional engineers.

FESA has been very active in trying to pressure the APEO Council to strictly enforce The Professional Engineers Act against unqualified individuals who are practicing professional engineering as defined by the Act. FESA's campaign for more active enforcement policies has not yet been successful. Very few, if any, individuals have been prosecuted by the APEO for breach of the Act in "in-house" (non-consulting) engineering practice.

II.3.2(b) Municipal Engineers Association (MEA)

The MEA is a voluntary association of professional engineers employed by municipal governments (both urban and rural). Only employee-engineers may be members. Consulting engineers who perform engineering services for municipalities may not belong to the Association. At present, somewhat more than 300 employee-engineers of municipalities are members of the Association. The MEA currently has three liaison committees with the following provincial government ministries: Housing, Transportation and Communications, and Environment.

Other activities of the Association include various educational and technical workshops and seminars and the development of manuals of professional and technical standards. The MEA does not engage in collective bargaining on behalf of its members.

II.3.3 Paraprofessionals: Ontario Association of Engineering Technicians and Technologists (OACETT)

II.3.3(a) History

The Ontario Association of Certified Engineering Technicians and Technologists is a voluntary "paraprofessional" association of engineering technicians and technologists. Engineering technicians
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and technologists, unlike professional engineers, hitherto have not been subject to any sort of legally sanctioned regulation. The history of OACETT is significant insofar as it illustrates the manner in which persons who traditionally have not been considered as "professionals" have sought to gain approved professional status by organizing themselves within the structure of a voluntary association having power to set minimum education and experience standards by way of certification, to enact and enforce a code of ethics and generally to act on behalf of the interests of its members.

During the early 1950's, a group of graduates from the Ryerson Polytechnical Institute felt the need for some group in the engineering community to represent the interests of engineering paraprofessionals. While professional engineers were regulated by and represented by the Association of Professional Engineers of Ontario, no such organization existed for the benefit of engineering technicians and technologists. While the Ryerson group failed to establish

any sort of organizational structure, it did impress upon the APEO the necessity to organize such a group. In 1957, the APEO established an Advisory Committee consisting of professional engineers and engineering paraprofessionals, whose purpose was to report to and advise the council of the APEO with respect to the status of engineering paraprofessionals. The Advisory Committee recommended a system for the evaluation and examination of engineering paraprofessionals which in effect would provide such persons with professional identity. An APEO Steering Committee subsequently was established and eventually became the forerunner of OACETT. The Steering Committee consisted of two professional engineers and several engineering technicians and technologists. In March 1962 the Steering Committee obtained Letters Patent incorporating the Ontario Association of Certified Engineering Technicians and Technologists. The objects clause of the Letters Patent provided that the Association was to be incorporated for the following purposes:

- (a) to advance the status and welfare of certified engineering technicians and technologists;
- (b) to increase the knowledge, skill and proficiency of certified engineering technicians and technologists;
- (c) for the objects aforesaid to bring together in an association certified engineering technicians and technologists in the Province of Ontario. 54

This then was the legal starting point of OACETT. During the early development of OACETT a very close administrative and organizational connection existed between the new association and the APEO. For example, OACETT did not have power to grant certificates to its members; the Association of Professional Engineers of Ontario through its Certification Board determined which persons were qualified to call themselves engineering technicians and technologists. The

operations of OACETT were still strictly controlled by the APEO, insofar as the new Association was financed and operated by the APEO. An informal understanding existed between OACETT and the APEO that as OACETT grew in terms of numbers, financing and maturity, increasing responsibility for the conduct of the Association's affairs would be delegated to technicians and technologists themselves. During the early years, OACETT did not have sufficient financial resources to hire its own staff. Thus the APEO provided legal advice to the OACETT, collected its fees, and certified its members. Gradually, however, OACETT took over these responsibilities. In October 1967 OACETT, for the first time, hired one of its own members as full time staff and early in 1969 the Association moved out of the APEO's offices. In 1973 the last remaining formal control of APEO over OACETT with respect to certification, registration, and admission into the Association was relinquished. With the tacit agreement of the APEO, OACETT assumed these responsibilities by virtue of supplementary letters patent.

II.3.3(b) Objects

The stated objects of the Association are as follows:

"(a) to establish, maintain and conduct an Institute or Association within Ontario for Engineering Technologists and Engineering Technicians for the purpose of granting registration and membership to such persons who meet the standards of the corporation:

(b) to assist such persons in advancing their status, recognition and welfare and in increasing their knowledge, skill and proficiency;

(c) to establish and maintain consistent qualification requirements for registration by the corporation of engineering technologists, engineering technicians and other classes of members of the corporation;

(d) to establish, promote and enforce high ethical and professional standards of conduct for engineering technologists, engineering technicians and other classes of members of the corporation;

(e) to accept donations, gifts, legacies and bequests for use in promoting the objects and carrying on the work of the corporation;

(f) to carry on benevolent work in connection with the families of dead, retired or incapacitated members who are in need; and

(g) to co-operate with other organizations having objects wholly or in part the same as or similar to the objects of the corporation." 55

II.3.3(c) Membership

There are six classes of members in OACETT: ordinary members, associate members, student members, fellow members, honorary members, and ordinary life members. Section 3-10 of OACETT By-law No. 15 describe the requirements of each classification of members.

It should be noted that not all persons who work as engineering technicians and technologists are members of OACETT. A recent study commissioned for the Ministry of Colleges and Universities of the Province of Ontario found that only 44.94% of its survey population of engineering technologists were members of OACETT. "[Of the 473 respondents who were not certified, 7.40% (35) were already working towards certification and 32.98% (156) stated that they intended to proceed in this direction. Of the remaining 282 (59.67%) who did not intend to seek certification, 251 were from the older Colleges of Applied Arts and Technology and Ryerson. The data suggests that the graduates of the newer C.A.A.T.'s and the more recent graduates of the older educational institutions are more likely to acknowledge the need of certification for the purposes of increasing their career potentials as engineering
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technologists."

The OACETT membership figure as of September 1976 was 8369,
of which 7753 were full members, 532 were associates and 84 were students.

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II.3.3(d) Organizational Structure

A detailed description of the organizational structure of the

OACETT is contained in OACETT By-law

No. 15 and includes the following subsections:

- (i) Council
- (ii) Officers (President, two Vice-Presidents, Executive Director, Secretary, Treasurer and Registrar)
- (iii) Nomination and Election of Council and Officers
- (iv) Executive Committee of Council
- (v) Chapter System

II.3.3(e) Committees and Boards

The OACETT has two types of committees: standing committees and other committees, sub-committees and task forces established by council for the purpose of carrying out certain specified activities. Section 45 of OACETT By-law No. 15 provides that the standing committees and boards of the Association shall be the following: the Executive Committee, the Registration Board; the Discipline Committee; and the Nominating Committee. All other committees and task forces of council are non-standing committees.

1. The Executive Committee

The powers of the Executive Committee are enumerated in section 46 of By-law No. 15. Before reaching council, the policy recommendations of each of the Association's committees, sub-committees and task forces are reviewed by the Executive Committee. In general, the Executive Committee may act upon those matters for which council already has clearly delineated the policy to be followed. In this way the workload of council is significantly diminished and its operations made more efficient.

2. The Registration Board

The powers of the Registration Board are prescribed in

section 47 of By-law No. 15:

REGISTRATION BOARD

47.(1) Notwithstanding anything to the contrary herein contained, the Registration Board established by By-law 14 of the Association is hereby continued as the first Registration Board under this By-law.

(2) The term of office of the Registration Board shall be for a one-year period commencing September 1 in any given year and terminating on August 31 of the next succeeding year or until the members are replaced by Council.

(3) The Registrar of the Association or other individual as provided for in Section 43 of this By-law shall be secretary to the Registration Board.

(4) The Registration Board shall submit an annual report and a budget to Council and shall make such other reports to the Council and Executive Committee required hereby and as it considers appropriate or as requested by Council or the Executive Committee.

(5) Notwithstanding anything herein contained, all policies, procedures, standards and practices of the Registration Board in effect at the time this By-law is approved are continued until such time as they are repealed or replaced, modified or discontinued by the Council.

(6) The terms of reference and powers of the Registration Board shall be as follows:

(a) The Registration Board shall recommend to the Executive Committee admission or non-admission, registration or non-registration of applicants for admission or registration to and in the Association.

(b) Subject to the approval of Council, the Registration Board shall be responsible for and have authority to establish and implement policies and procedures relating to:

(i) Registration and membership requirements and standards or registration or membership in the Association.

(ii) The examination of applicants for registration or admission to membership in the Association.

(iii) The carrying on of any existing operations of the present Registration Board, except as otherwise herein provided.

(iv) The requirements for reclassification of present membership categories or classes to new membership categories or classes.

(v) Such other matters as may from time to time be referred by the Council to the Registration Board.

(c) The Registration Board shall advise the Council in matters of education and experience for registration by the Association of current members and applicants for membership and on the direction of Council shall act for the Association in these matters.

(d) Subject to the approval of Council, the Registration

Board shall develop policy with respect to accreditation, curricula, registration standards, the adoption of national standards, examinations, liaison with education institutes, schools and colleges and such other matters as it deems necessary and appropriate and shall report to the Council from time to time as requested.

(e) The Registration Board shall have the power to appoint sub-boards and sub-committees responsible to the Registration Board and to delegate to these sub-boards and sub-committees such responsibility and authority of the Registration Board needed to carry out the specific function of the appointed sub-board or sub-committee and the Registration Board. Such sub-boards and sub-committees shall include but not be limited to the following:

(i) The Board of Examiners

(ii) The Accreditation Board

(f) The Registration Board shall assume responsibility for consistency of decisions from the Board of Examiners.

(7) Any recommendation of the Registration Board with respect to admission or non-admission or registration shall be forwarded to the Registrar within ten (10) days of the date of the Registration Board's recommendation. The Registrar will bring the recommendations to the Executive Committee for confirmation at its next meeting. The Executive Committee may confirm, vary or reverse the decision of the Registration Board.

3. The Discipline Committee

The powers of the Discipline Committee are prescribed by

section 49 of By-law No. 15:

THE DISCIPLINE COMMITTEE

49.(1) The Discipline Committee shall:

(a) In accordance with the Code of Ethics and subject to the approval of Council be responsible for the establishment of standards of ethical competence and behaviour for the members of the Association;

(b) Provide for investigation of any and all complaints referred to it or of any matter which it considers likely to affect the ethical practice of the members of the Association;

(c) Authorize the issuing of letters of warning, correction, advice or admonition by the Registrar, with the objective of forestalling or preventing actions or practices which might lead to complaints;

(d) Provide to the Council or to members, advice, assistance and interpretation in matters relating to differences, misunderstandings and alleged breaches of the Code of Ethics;

(e) When necessary, report violations of the Code of Ethics to the Council and on the direction of Council cause any decision that the Council might make in such

instances to be published in the Association's publications.

(2) The Registrar shall be ex-officio a member of the Discipline Committee.

4. Nominating Committee

The powers of the Nominating Committee are prescribed by section 50 of By-law No. 15:

NOMINATING COMMITTEE

50.(1) The Nominating Committee shall, pursuant to Section 26 of this By-law, receive nominations for the office of President, two (2) Vice-Presidents and thirteen (13) regional Councillors. It is the responsibility of the Committee to ensure that at least one nomination is received for each office, and to cause an election to be conducted to determine a single nominee for each office in the event that more than one nomination is recieved.

(2) The Nominating Committee shall consist of no fewer than five (5) ordinary members nor more than nine (9) ordinary members, including the chairman. The membership of the committee shall reflect the geographical distribution of the Association membership.

(3) In the event that any member of the Nominating Committee is nominated for office, that member shall declare a conflict of interest and abstain from the discussion and voting on his candidacy.

5. Strategy Committee

The Strategy Committee functions as a long range policy planning body. Its purpose is to develop long range policy directives with respect to every aspect of the association's political and regulatory activities and to suggest - with the support of the Finance Committee - possible policy alternatives. The Strategy Committee ultimately makes its recommendations to the Executive Committee which in turn makes its recommendations to Council.

6. Editorial Committee

The Editorial Committee monitors and approves the editorial policy of the publications of the association including the association newsletter, magazine, brochures, publicity, communications with its members, and briefs and submissions to government.

7. Finance Committee
8. Chapter Affairs Committee
9. Annual Meeting Committee
10. Joint APEO/OACETT Liaison Committee

This committee encourages discussion between members of the APEO and OACETT with respect to the resolution of the problems surrounding the precise definition of the scope of practice of engineers and engineering technicians and technologists respectively.

II.3.3(f) Internal Operations

The By-laws of the OACETT provide for the appointment by council of four officers of the association whose duties are to carry out the day to day administrative requirements of the association. Section 39 of By-law No. 15 prescribes the duties of the executive director:

EXECUTIVE DIRECTOR

39. Subject to the authority of the Council and the supervision of the President, the Executive Director shall have general management and direction of the Association's business and affairs. He shall have the power to appoint or remove any and all officers, employees and agents of the Association, who are not elected, and to settle the terms of their employment and remuneration.

Section 40 prescribes the duties of the secretary:

SECRETARY

40. He shall give or cause to be given all notices required to be given to the members of the Association or the Council, or committees. He shall attend all meetings of the members of the Association, of the members of each regional division, and shall enter or cause to be entered in books kept for that purpose, minutes of all proceedings at such meetings. He shall be the custodian of the seal of the Association and of its books, records, and documents. He shall perform such other duties as may from time to time be prescribed by Council. He shall be allowed to delegate the responsibility of attending meetings of members of regional divisions to an ordinary member in good standing.

It should be noted that at present the executive director of the association also acts as secretary of the association. Section 41

prescribes the duties of the treasurer:

TREASURER

41. The treasurer shall cause to be kept full and accurate books of account in which shall be recorded all receipts and disbursements of the Association and, under the direction of Council, shall control the deposit of money, the safe keeping of securities and the disbursement of the funds of the Association. He shall render to Council at the meetings and whenever required of him an account for all of his transactions as Treasurer and of the financial position of the Association. He shall perform such other duties as may from time to time be prescribed by Council.

And finally section 42 of By-law No. 15 prescribes the duties of the Registrar:

REGISTRAR

42.(1) The Registrar shall keep a complete and accurate register of the Association's membership in all categories or classes, and of applicants for membership (whether accepted or not) and record or cause to be recorded dates of registrations and recordings, receipts of applications for membership or for renewal or reinstatement of membership, receipt of fees, dues, levies and assessments, and such further and other information as may be directed by Council or the Registration Board. He shall report to Council all violations of the conditions of membership and of the Code of Ethics of the Association that shall be brought to his attention through the keeping of such records or by other means howsoever.

(2) He shall maintain a register of all members, including their names, addresses, registered categories or classes and such other data that may be required by Council or the Registration Board to be so recorded.

In addition to the aforementioned officers whose appointment and duties are prescribed by the Association's by-laws, the Association also hires nine other full time staff members. One is a Director of Communications and Publications, whose duties include the editing of the Association's journal, the newsletter, and various promotional brochures and pamphlets. Another is the Assistant Registrar whose principal duty is to supervise and coordinate the Association's accreditation system. An executive secretary, accounting coordinator, three admissions clerk/typists, a receptionist, and a mailing room clerk make up the remaining association staff.

Not only do the Association's officers report directly to Council, but they also work in an advisory capacity with the Association's committees: thus the Executive Director normally works with the Executive Committee, the Treasurer with the Finance Committee and the Registrar with the Registration Board.

II.3.3(g) Roles and Powers

This section will briefly describe the various activities of OACETT with respect to the registration of members, accreditation of study programmes, the discipline of its members and the services and benefits provided to its members. It is significant to note that while the OACETT does not have the statutory power to regulate the practice of engineering technology, the types of activities carried on by the Association and the manner in which such activities are executed closely parallel that of a legislatively sanctioned regulatory body such as the APEO.

(i) Registration and Certification

There are four basic requirements for becoming an "ordinary member" of the Association. The applicant must be ordinarily resident in the province of Ontario at the time of application, provide evidence of good character satisfactory to the Council if required to do so by the Registrar, pay the registration fee, and meet the registration standards and academic and experience requirements prescribed
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by the council.

1. Academic Requirements for Registration

Two classes of "ordinary" membership exist: Engineering Technologist and Engineering Technician. The following

are the requirements for each class of membership:

Engineering Technologist

1. Graduation from an accredited programme in engineering technology at an Ontario College of Applied Arts and Technology. (N.B. Normally of 3 years or 6 semesters duration) or,
2. Equivalent advanced technical course subjects, selected from the syllabi of examinations published by the Association, or,
3. Certificates recognized as equivalent by the Registration Board, or,
4. Examinations established by the Registration Board.

Engineering Technician

1. Graduation from an accredited engineering programme at an Ontario College of Applied Arts and Technology. (N.B. Normally of two years or 4 semesters duration) or,
2. Equivalent technical course subjects, selected from the syllabi of examinations published by the Association, or,
3. Certificates recognized as equivalent by the Registration Board or,
4. Examinations established by the Registration Board."

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There are four ways to obtain academic credit for the purpose of OACETT registration and certification:

- College of Applied Arts and Technology programmes.

A complete listing of engineering technology programmes accredited by OACETT may be found in an OACETT brochure, entitled "Accredited Engineering Technology Programs ."

- APEO Professional Engineer Examination Programme.
- University or Department of Education courses.

(These credits are normally in the fundamentals of physics, chemistry, mathematics, English and Economics .)

- OACETT Registration Board Examinations.

Each April OACETT conducts examinations for persons who do not otherwise have the required academic qualifications. There is an initial registration fee of \$50.00 and an additional fee of \$20.00 for each examination taken. No minimum or maximum number of examinations need be written in any one year. The examination candidate

is supplied with the OACETT Registration Board's syllabus of examinations, examination course outline and names of recommended texts. No instruction whatsoever is provided by OACETT.

2. Experience Requirements

In addition to the aforementioned academic requirements for certification, the OACETT requires two years of "contemporary experience consistent with the level of certification warranted by the academic credits granted."⁶⁰ The types of experience fulfilling this require-

ment may be found in the OACETT Registration Board Policy and Procedure Manual.⁶¹

3. The Process of Registration

When an application is first received it is initially reviewed and assessed by the Registrar and his staff. All applications are then passed on to the Board of Examiners - a sub-committee of the Registration Board - for an assessment of the applicant's academic qualifications. The terms of reference of the Board of Examiners are as follows:

- "(a) advisors to the Certification* Board on academic matters
- (b) assess all applicants on the basis of academic qualifications only. The Board of Examiners may delegate assessment authority for certain standard educational programmes to members of the staff.
- (c) recommend special consideration to the Certification* Board where documentation justifies it.
- (d) modify existing syllabi and develop new ones.
- (e) assist Certification* Board in developing new policies.
- (f) coordinate examination programmes, oversee the preparation and marking of examinations.⁶²
- (g) participate in accreditation procedures."

* The language of the policy uses the word "Certification" whereas in fact it should read "Registration". OACETT is presently reviewing this policy.

Having assessed the academic qualifications of the applicant, the Board of Examiners passes on the application to the Registration Board.

4. The Registration Board

The Registration Board assesses both the academic and experience qualifications of each applicant. The Registration Board may revise academic credits already assigned by the Board of Examiners. Having completed its assessment, the Registration Board makes its recommendations to the Executive Committee of Council with respect to admission or non-admission. The recommendations of the Executive Committee are then passed on to Council for final disposition. The terms of reference of the Registration Board are as follows:

- (a) advisors to OACETT Council on Registration policy
- (b) implement Registration policy
- (c) assess all applicants on the basis of academic qualifications and experience
- (d) communicate decisions to applicants
- (e) conduct continuing communications with Colleges, Department of Education and other educational institutions with regard to standards, Registration procedures and promotion of the programme
- (f) conduct continuing communications with industry with a view to promoting the programme
- (g) conduct examination programmes
- (h) recommend accreditation policies and procedures
- (i) publish syllabi and other promotional data 63
- (j) liaison with equivalent bodies in other provinces.

5. Appeal Procedure

The By-laws of the Association prescribe the following procedure for appealing the recommendation of the executive committee with respect to admission, non-admission, registration or non-registration:

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APPEAL PROCEDURE

48.(1) Any person including any member or registrant of the Association who is aggrieved by the recommendation of the Executive Committee with respect to admission, non-admission, registration or non-registration, may appeal to the Council.

(2) Such appeal shall be launched by a notice of appeal in writing delivered to the Registrar of the Association within twenty (20) days of the date that the recommendation of the Executive Committee comes to the attention of the person aggrieved.

(3) The notice of appeal shall set out the grounds for appeal in a short and summary manner and the evidence or records that the person aggrieved intends to rely upon.

(4) The Registrar shall make available to the Council on the appeal all records or information that the Board of Examiners, Registration Board or the Executive Committee had before it in the making of their respective decisions.

(5) The Council shall hear the appeal on a day no later than three (3) months from the date of delivery of the notice of appeal for the hearing of the appeal and the Registrar shall notify the aggrieved person forthwith of the date set for the appeal.

(6) Upon the hearing of the appeal, the aggrieved person, or his representative, may make reasonable submissions to the Council orally or in writing if he is so advised. Upon the appeal being heard, the Council may make such decision as it by majority vote deems just in all of the circumstances.

(7) The time limits set forth in this By-law applicable to an aggrieved person may be abridged or enlarged in the discretion of Council.

Appeals are heard by the full Council as covered by By-law No. 15, section 48(1).

(ii) Accreditation

Consistent with its objective of creating and upgrading the professional status of engineering paraprofessionals, OACETT has instituted an accreditation programme administered by the Association's accreditation Board, a sub-committee of the Registration Board. The objective of accreditation is to examine the formal academic programmes of post secondary institutions offering courses in engineering technology in order to determine whether the graduates of such programmes may be exempted from the Association's registration examinations. OACETT seeks to attain two additional specific objectives in its accreditation programme:

[T]o provide an auditing mechanism for engineering

technology programmes independent of the educational system. To serve the public, industry, educational institutions, and the engineering community generally by stimulating curriculum improvement in existing programmes in engineering technology and assisting in the development of educational models for new programmes." 65

The accreditation process consists of two distinct stages. First, the academic programme of the educational institution is evaluated by a team of specialists from industry, the academic institutions, government, other forms of public service and by officers of OACETT. Second, the accreditation team visits the institution for first-hand inspection of the facilities and discussion with members of the faculty. Information with respect to OACETT accreditation policy may be found in a document entitled "OACETT Accreditation Board Policy." 66

The list of accredited engineering technology programmes may be found in the OACETT brochure entitled "Accredited Engineering Technology Programmes." Finally, the OACETT syllabi and accreditation procedure may be found in the OACETT "Registration Board Policy and Procedure Manual." 67

(iii) Discipline and Code of Ethics

In addition to the identification, prescription and administration of academic and experience qualifications, another important attribute of "professional status" is the identification and enforcement of "professional ethics." To that end, OACETT has developed a Code of Ethics, the primary objective of which is to upgrade and regulate the standards of ethics and competence of its members. The Code of Ethics of the Association is contained in section 54 of By-law No. 15:

CODE OF ETHICS

54. The Code of Ethics of the Association is as follows:

THE CERTIFIED ENGINEERING TECHNICIAN OR TECHNOLOGIST
RECOGNIZES THE PRECEPTS OF PERSONAL INTEGRITY AND
PROFESSIONAL COMPETENCE AS FUNDAMENTAL ETHICS, AND AS SUCH
HE:

SHALL have proper regard for the physical environment and
the safety, health and well-being of the public;

SHALL always conduct himself in a responsible manner and uti-
lize fair and equitable business practices in dealing with
his colleagues, clients and associates;

SHALL undertake only those assignments for which he is competent
by virtue of his training and experience, and where warranted,
engage or advise the engagement of such specialists as are
required to enable him to properly complete assignments;

SHALL protect to the fullest extent possible, consistent with
the well-being of the public, any information given him in
confidence by an employer, colleague or member of the public;

SHALL refrain from making unjustified statements or from
performing unethical acts which would discredit the Association
or any of its members;

SHALL indicate to his employer or client any adverse consequences
which may result from an over-ruling of his technical judgment
by a non-technical authority;

SHALL inform his employer or client if he is financially
interested in any vendor or contractor, or in any invention,
machine or apparatus, if such interest could conflict with
the interests of the employer or client. He shall not
allow such interest to affect his decisions regarding technical
services which he may be called upon to perform;

SHALL avoid any connection with such advertising which impli-
city or explicitly demeans the competence of other members of
the Association;

SHALL strive to maintain his proficiency by updating his
technical knowledge and skills as required to properly
practice engineering technology;

SHALL uphold the provisions of this Code of Ethics, and
without fear or favour report in the proper manner unethical
or incompetent conduct of any other member to the President
of the Association.

The By-laws also prescribe a procedure for dealing with the

12.(1)

(f) An application for reinstatement of membership from an applicant who has been suspended or expelled from the Association by the Council shall be submitted to the Council for review and such applicant may be reinstated only upon resolution of Council. Such resolution may contain such terms and conditions for reinstatement as the Council deems necessary, including a requirement that the applicant undergo reinstatement examinations.

(g) Any member may be required to undergo periodic examinations or testings for the purpose of maintaining membership in the Association if the Council by resolution so determines.

(h) The Council may after a notice and a hearing as herein provided, reprimand, suspend or expel a member either absolutely or on condition for:

(i) Non-compliance with the By-laws, including the Code of Ethics or the resolutions of the Association;

(ii) Failure to meet the required grade or grades as a result of periodic examination or testing.

(2) Council may on its own motion or shall at the written request of twenty-five (25) ordinary members convene a meeting of Council for the purpose of hearing and determining whether a member should be reprimanded, suspended or expelled as aforesaid.

(3) The Registrar shall give the member concerned notice in writing of such a meeting of Council and such notice shall be mailed by prepaid registered shown on the records of the Association or shall be personally delivered, and if posted as herein required, shall be deemed to have been received by the member one (1) day after such posting.

(4) Such notice shall contain reasonable details of the grounds upon which Council decided to convene such a meeting and shall inform the member of his right to be present with a representative or counsel if he so desires. Such notice shall further set forth that, failing the appearance in person of the member at the meeting of Council therein specified, the Council may, in the member's absence proceed with the hearing and determine whether the member shall be reprimanded, suspended or expelled as aforesaid.

(5) Council shall reduce its decision after such hearing to a written decision and notice of the decision of Council together with same shall be served personally upon the member or by prepaid registered mail in the same manner as for service of the notice of the hearing aforesaid.

(6) Any decision of Council as a result of a hearing held pursuant to this paragraph may be published by Council.

It should be noted that, except in the very few instances in which membership in OACETT is a requirement of employment, no formal consequences

flow from expulsion from the association. An expelled member may still hold himself out as an engineering technician or technologist and may practice engineering technology without membership in OACETT.

II.3.3(h) Services and Benefits

1. Publications

The Ontario Technologist is the official journal of the Association and is published bi-monthly. Its primary purpose is to promote engineering technology in the province. OACETT members are encouraged to contribute articles to the journal. The journal serves as a forum for readers' comments and career advertising, and includes various articles dealing with the technical aspects of the work of engineering technicians and technologists.

OACETT Newsletter. The Newsletter, which is published bi-monthly, is the primary vehicle through which OACETT keeps its members up to date on Association business. The newsletter publicizes major decisions of the council, includes short engineering articles and features career opportunities open to engineering technicians and technologists.

Literature. The Association distributes the following publications and brochures to industry, government, chapters, members and interested individuals on request: OACETT and Industry, Registration and Membership, Accredited Programmes, OACETT Associate Membership.

2. Code of Ethics

The Association's Code of Ethics is considered a benefit and service to its members insofar as it attempts to render members accountable to the public for their participation in engineering

technology and (presumably) will increase public confidence in all engineering paraprofessionals.

3. Educational Upgrading

Members who are registered at a level lower than "Technologist" may upgrade themselves academically by participating in the Association's programme of examinations, by completing CAAT evening courses, through APEO examinations or by completing university or Department of Education courses.

4. C.E.T.

The designation Certified Engineering Technologist (C.E.T.) is a registered Canadian trademark and in Ontario only members of OACETT have the legal right to use the title of C.E.T. after their name.

5. Association Ring

A ring specifically designed for engineering technicians and technologists may be worn by registered members having five years of education and/or experience beyond secondary school.

6. Membership in the Canadian Council of Engineering Technicians and Technologists

OACETT along with the nine other provincial associations belongs to CCETT. The primary function of CCETT is the creation of national syllabi for technologists, thereby facilitating the transferability of academic qualifications from province to province.

7. Salary Survey

An annual salary survey based upon registration, level, and year of birth of the Association's members is conducted and the results are circulated to members and, upon request, to industry. The salary survey enables engineering technologists to negotiate

salaries more knowledgeably with their employers.

8. Insurance Programmes

The Association makes available to its members car and home insurance, group life insurance and group disability income protection.

9. Equity Fund

Through special arrangements with the Association of Professional Engineers of Ontario an investment fund is available to members of OACETT.

II.3.3(i) Policy Objectives

It is probably accurate to say that the single most important objective of the OACETT is to improve the professional status of engineering technicians and technologists in their role as respected members of the "engineering team." The rapid and exponential increase in engineering technological knowledge during the post-World War II era inevitably gave rise to an actual and perceived shortage of persons trained in engineering skills at the lower levels. Increased requirements for engineering "assistants" required the training of persons possessing technical skills somewhat more sophisticated than those possessed by draftsmen but somewhat less sophisticated than those possessed by professional engineers. As a result, post-secondary institutions such as the Colleges of Applied Arts and Technology and Ryerson Polytechnical Institute began to train persons known as "engineering technicians and technologists." These new members of the "engineering team" soon found that their interests could not be properly served by the APEO, under whose auspices they were then being protected. The establishment of a professional organization independent of the APEO - some of whose members perhaps would always regard technicians and

technologists as "assistants" or "paraprofessionals" - inevitably led to the desire of technicians and technologists to develop a "professional" self image and to delegate voluntarily to that body the power to define the educational and experience qualifications to be attributed to the new profession and to encourage the development and definition of parameters of "professional responsibility" through the enforcement of a Code of Ethics.

While a general consensus exists among engineering technicians and technologists that the attainment of "professional status" will require some form of public regulation, there are differences of opinion with respect to the form that public regulation ought to take. This researcher has been told by officers of OACETT that the majority of its membership does not favour OACETT becoming the body to regulate the practice of engineering technology. Thus the OACETT prepared a document called "Proposal for an Act to Recognize by Certification Technicians and Technologists" which envisages a commission - called the "Ontario Technologists and Technicians Commission" - established by statute to provide for the certification of engineering technicians and technologists. It should be noted that this proposal does not attempt to regulate the practice of engineering technology, but rather proposes to limit the use of the titles of "engineering technician" and "engineering technologist" to holders of certificates. This proposal thus envisages a system of certification rather than licensure. On the other hand, a significant minority of OACETT members hold to the view that the appropriate institutional mechanism for the regulation of engineering technicians and technologists ought to be within the existing framework of the OACETT. Further,

there seems to be a growing movement within OACETT to regulate the practice of engineering and engineering technology within "umbrella legislation" governing professional engineers, technologists, technicians, architects and land surveyors.

A major aspect of the Association's policy initiatives is the presentation of briefs and submissions to government with a view to directly affecting governmental policy. The following submissions have been made:

1. Brief to the Commission on Post-Secondary Education in Ontario, 1970.
2. Brief to the Minister of Colleges and Universities entitled "Proposal for an Act to Recognize by Certification Technicians and Technologists," 1971.
3. Brief in Response to Porter Report to the Board of Governors, Conestoga College of Applied Arts and Technology, 1974.
4. Submission to the Minister of Colleges and Universities Task Force on Engineering Technology Programs in Thunder Bay and North-western Ontario, 1974.
5. A Position Paper Presented to the Minister of Colleges and Universities on the Recommendations of Goodings, Sidlofsky, Goodings and Associates in their Study Entitled "The Engineering Technologist," 1976.
6. A Position Paper Presented to the Minister of Colleges and Universities and to the Provincial

Engineering Technology Consultative Committee on
Part-time Education in Engineering Technology
in the Province of Ontario, 1976.

In addition to official submissions and briefs to government, OACETT corresponds with the Minister of Colleges and Universities and the Attorney General on a regular basis with respect to issues of concern to the Association.

The Accreditation of Engineering Technology
Programs

The activities of the OACETT with respect to the voluntary accreditation of engineering technology programs in the Community Colleges has already been discussed supra in Section II.3.3(g), Roles and Powers. It should be emphasized that the participation of the Community Colleges in the OACETT accreditation programme is entirely voluntary. Insofar as the accreditation programme lends credence to OACETT's image as a responsible professional association concerned with the maintenance of high educational standards for its members, the accreditation programme obviously is a success. The OACETT brochure entitled "Accredited Engineering Technology Programs" indicates that almost every College of Applied Arts and Technology in Ontario, Lakehead University, Ryerson Polytechnical Institute, and several other technological institutes have allowed themselves to be subjected to the OACETT accreditation programme.

Registration

The third important aspect of OACETT's policy objectives is the Association's concerted effort to persuade the employers of engineering technicians and technologists to require membership (or eligibility for membership) in the OACETT as a condition precedent to

employment. The number of employers requiring employee technicians and technologists to belong to the OACETT is still fairly low.

Since its inception, the OACETT has attempted to involve employers of engineering technicians and technologists in its activities. Beginning in 1970, the OACETT sponsored Manpower Seminars through its chapters and local chapters of the APEO. By inviting local employers of engineering technicians and technologists to the seminars, the OACETT hoped to increase their awareness of the role that the OACETT might play in upgrading the educational, ethical and professional standards of engineering technicians and technologists. When the Manpower Seminars had to be discontinued because of lack of funds, the OACETT decided to concentrate its efforts in persuading the Community Colleges to accept OACETT accreditation in the hope that faculty instructors would encourage graduates to join the Association. The OACETT promotes itself to employers of engineering technicians and technologists in other ways as well: it provides information about members who might be suitable to fill certain job openings, when asked it sets up job descriptions and salary scales for employers, and finally, when invited by the employer, OACETT will assess the individual qualifications of employees who are not yet members of the Association.

II.3.4 Paraprofessionals at the National Level: Canadian Council of Engineering Technicians and Technologists (CCETT)

Engineering technicians and technologists have a national association similar to the national association of professional engineering regulatory associations, the Canadian Council of Professional Engineers. The Canadian Council of Engineering Technicians and Technologists consists of representatives of each provincial voluntary association of engineering technicians and technologists. Incorporated

in 1973, CCETT is still very much at the early organizational stage. To date its main accomplishment has been the development of minimum academic standards in six major discipline areas for engineering technology. The following documents are relevant to understanding the organizational structure and functioning of the Council:

- Letters Patent
- By-laws
- Syllabi of Examinations

II.3.5 Other Special Interest Bodies

II.3.5(a) Canadian Construction Association (CCA)

The Canadian Construction Association is a voluntary trade association of persons, firms and associations having a business (and to some extent a professional) interest in the construction industry in Canada. The stated objects of the CCA are:

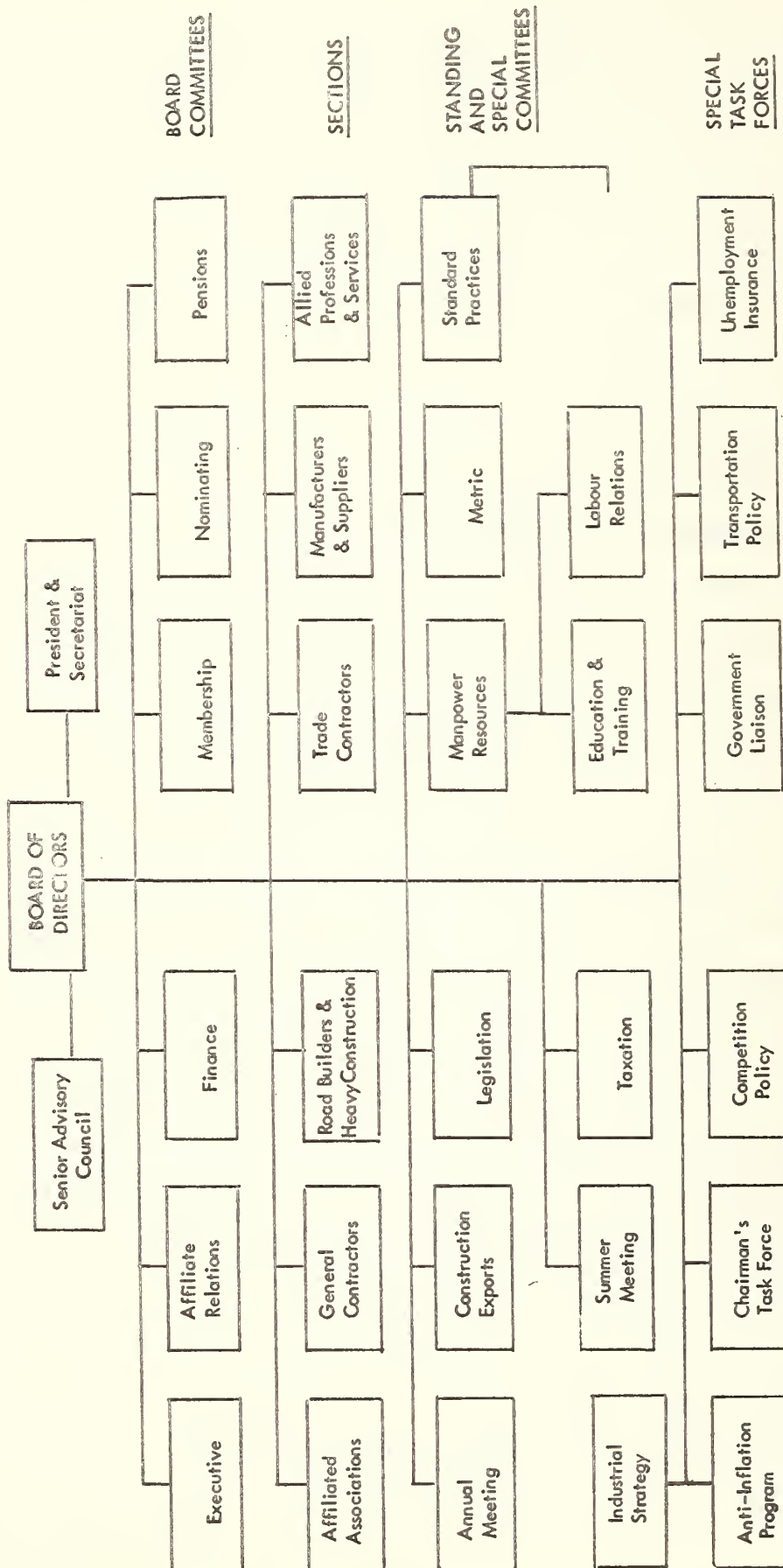
- a) to act as the voice of the construction industry in Canada on matters of national concern and interest;
- b) to promote better relations between its members and owners, architects and engineers;
- c) to establish and maintain methods of practice between members within the industry;
- d) to acquire and disseminate useful information concerning the industry;
- e) to expand the construction market and improve conditions in the combined industries;
- f) to co-ordinate the units of the industry in its producing, manufacturing, distributing, professional and constructive activities, thereby increasing its efficiency and extending its usefulness;
- g) to provide the medium whereby affiliates may exchange opinions and co-ordinate their efforts.

The membership of the CCA reflects the very broad range of trades and professions having an interest in the construction industry. Members include general contractors, road builders, industrial and trade contractors, industrial (heavy) road builders, manufacturers

The organizational structure of the Association is illustrated in the following chart: (From the CCA Annual Directory, 1976, Appendix B.8)

FIGURE II.3

CANADIAN CONSTRUCTION ASSOCIATION ORGANIZATIONAL STRUCTURE



Note: In addition the CCA provides the Secretariat for the following:

1. Canadian Construction Documents Committee
2. National Construction Industry Development Foundation
3. Presidents' Consultative Committee
4. Joint Labour-Management Sub-Committee
5. Construction Public Relations Advisory Council

and suppliers of construction equipment, engineers and architects. As we shall see in another section of this paper, contracting and construction companies (as well as engineers who own construction companies) may practise engineering in their own names if they are licenced by the APEO to do so (through the issuance of a Certificate of Authorization).⁷⁰ Banks, insurance companies and bonding companies having an interest in the construction industry in Canada may become "Affiliate Members" of the CCA.

It will be seen from the Committee structure illustrated in Figure II.3 that a primary function of the Association is to act as a lobbying and liaison body on behalf of the construction industry of Canada. The Association liaises with all levels of government and industry, as well as with the APEO, the Ontario Association of Architects (OAA) and other related professional bodies. With respect to its connections with the APEO and the OAA, the CCA makes representations concerning standard form contracts, professional misconduct and other matters of concern to regulatory bodies. An information sheet published by the CCA provides a more detailed description of the Association's various activities in respect of industry relations and government relations.

In addition the following documents relating to the activities of the Canadian Construction Association are informative:-

- Constitution and By-laws
- Annual Directory, 1976 (containing names of officials of the Association, names of committee members and list of all members of the Association)
- Annual Report, 1975 (outlines in detail the activities of the Association and its Committees)
- Standard form contract documents developed by the CCA: Design-Build Stipulated Price Contract and Stipulated Price Contract

- Canadian Construction Association Publication Order Form.

II.3.5(b) Construction Specifications Canada (CSC)

Construction Specifications Canada is a national voluntary association to which engineers, architects and other professionals and tradesmen interested in construction specification writing may belong. The main activities of CSC are directed towards three objects:

1. promoting the interest of those persons concerned with specification writing;
2. assessing and certifying - on a voluntary basis - standards of expertise in specification writing in Canada; and
3. acting as a forum for the transfer of the increasingly complex technological information associated with the field of specification writing;

Since CSC is a technical and trade association peripheral to the central regulatory focus of this paper, it will not be discussed in detail here.

II.3.5(c) Institute of Chartered Engineers of Ontario (ICEO)

The Institute of Chartered Engineers of Ontario is a voluntary association of some 500 engineers, many of whom, for various reasons, have not become members of the Association of Professional Engineers of Ontario.

II.4. Technical Bodies and Learned Societies

II.4.1 Engineering Institute of Canada (EIC)

The Engineering Institute of Canada is the national learned society of professional engineers. As a learned society, its main concerns are the dissemination of technological information that

is of relevance to the practice of engineering and the advancement of the interests of engineers as they relate to technological issues.

The stated objects of the EIC are as follows:

- The Institute is primarily concerned with becoming incorporated under the name "The Institute of Chartered Engineers of Ontario."
- To advance the quality and scope of Canadian Engineering.
- To stimulate the application of engineering to the benefit of mankind.
- To promote the creation, exchange, diffusion of and access to technical and other information relevant to engineering for both technical and public interest.
- To complement the provincial licensing associations and corporations in serving the national, regional and local needs and interests of its members.
- To cooperate with and provide assistance to all levels of government and with their regulatory bodies on matters concerned with or involving the use of engineering technology and the practice of engineering.
- To direct study and make report on matters of national, regional and local interest affected by engineering technology.
- To collaborate with universities and other educational institutions to advance the relevance and effectiveness of engineering education at all levels.
- To foster intra- and international contacts and co⁷¹operation in engineering and with allied fields.

The EIC consists of four Constituent Societies to which engineers of the appropriate discipline belong: The Canadian Society for Mechanical Engineering; The Canadian Geotechnical Society; The Canadian Society for Civil Engineering; and the Canadian Society for Electrical Engineering.

The EIC is Canada's oldest engineering society. :

It did not always restrict its activities to the advancement of technological knowledge amongst engineers -- at the beginning of this century it was the only engineering body in existence.

As such the EIC was engaged in the advancement of the special business and professional interests of engineers, who at that time did not have self-governing professional bodies. As we have already seen, the EIC was quite influential in lobbying for the enactment of legislation creating the Association of Professional Engineers of Ontario as a licensing body to regulate the practice of engineering in Ontario. It played a similar role in other provinces as well. However, with the emergence of the APEO and other provincial regulatory bodies (and their membership in the national association of regulatory bodies -- the Canadian Council of Professional Engineers), and the emergence of the Association of Consulting Engineers of Canada as a trade association representing the special business and professional interests of engineers in private practice, the scope of activities carried on by the EIC has necessarily been restricted to those of a learned society. This division of functions has been formally institutionalized in a bilateral agreement entered into with the CCPE in 1973 which precisely delineates and coordinate the respective scope of activities of the two associations. The terms of this bilateral agreement are outlined in an article by Byron Kerr, "The E.I.C. on the Move," Engineering Journal, September 1973, Vol. 56/9, pp. 7ff. The EIC hopes to enter into a similar agreement with the Association of Consulting Engineers of Canada in the near future.

As a learned society many of the activities of the EIC are concerned with the advancement of technological learning amongst Canadian engineers. This function is seen by the profession as a very important one insofar as most provincial self-governing bodies do not require periodic recertification and re-examination of professional engineers.

The activities of the EIC may be summarized as follows:

- The EIC has seventeen national Technical Divisions -- such as Municipal, Design, Heat Transfer, Mechanical, Electrical, etc. -- which at various times hold meetings and seminars to discuss the latest advancements in technology.
- Each year the Ontario Region of the EIC and the APEO jointly sponsor a large engineering conference called ENGCON in which technical and professional matters are discussed.
- The EIC has a continuing education programme which consists of seminars, meetings and instructional courses held in conjunction with the provincial regulatory bodies, the universities and employers.

In addition to these activities, the EIC is also very active in making representations to government (for example to the Senate Committee on Science Policy) concerning matters of a technical nature affecting engineers. The EIC has also participated in various "public education" programmes (such as providing information on the uses and abuses of nuclear energy) at the request of the Federal Government.

II.4.2 Other Technical Bodies and Learned Societies

In addition to the Engineering Institute of Canada, Canadian engineers may belong to many other national and international technical societies engaged in the dissemination of technological knowledge.

These bodies include:

American Bridge, Tunnel & Turnpike Association
American Concrete Institute
American Railway Engineering Association
American Society of Civil Engineers
American Society of Heating, Refrigerating and Air
Conditioning Engineers
American Society of Mechanical Engineers
American Society for Testing Materials
American Water Works Association
Canadian Aeronautics and Space Institute
Canadian College of Advanced Engineering Practice
Canadian Institute of Mining and Metallurgy
Canadian Institute on Pollution Control
Canadian Operations Research Society
Canadian Society of Agricultural Engineering

Canadian Standards Association
Canadian Technical Asphalt Association
Canadian Transit Association
Canadian Transportation Research Forum Highway Research
Board
Illuminating Engineering Society
Institute of Electrical and Electronics Engineers
Institute of Traffic Engineers
Institution of Civil Engineers, U.K.
Institution of Highway Engineers, U.K.
Institution of Railway Signal Engineers
Institution of Structural Engineers, U.K.
International Crossings Committee
International Geotechnical Society
International Municipal Parking Congress
Prestressed Concrete Institute
Roads and Transportation Association of Canada

II.5 Liaison or Coordinating Bodies

II.5.1 Ontario Engineering Advisory Council (OEAC)

The Ontario Engineering Advisory Council is an independent and autonomous liaison body sponsored by the following persons and associations:

- The Provincial Secretary for Social Development
- The Provincial Secretary for Resources Development
- The Minister of Education
- The Minister of Colleges and Universities
- The Minister of Industry and Tourism
- The Committee of Ontario Deans of Engineering
- The Committee of Presidents of Colleges of Applied Arts and Technology
- The Association of Professional Engineers of Ontario.

Other associations such as the Ontario Association of Engineering Technicians and Technologists and the Ontario Region of the Engineering Institute of Canada also participate in the activities of the OEAC from time to time.

The stated objectives of the Council are as follows (from "Productivity", Ontario Engineering Advisory Council Report, July 28, 1976, p.1).

[T]o provide information and advice to its sponsoring bodies, and to interested or related institutions or organizations;
to foster relationships concerning engineering and engineering related matters, between Ministries of the Provincial Government, post-secondary educational institutions, industry, and the licensing body for engineers in the Province of Ontario;
and finally, to undertake research projects, surveys, seminars, discussions, and debates, for the purpose of providing data or opinions emanating from sources and persons suitably qualified.

The activities of the OEAC are reflected in the annual seminars held by the Council. The following seminars, reports of which are contained in Appendix B.10, are illustrative of the interests of the Council:

- (i) 1969--"Government, Industry and Education: Interaction for Productivity"
- (ii) 1970--"Engineering Education in Ontario"
- (iii) 1971--"Education and the Profession: Engineering's Vital Interface"
- (iv) 1972--"An Industrial Strategy for Canada"
- (v) 1973--"STI [Scientific and Technical Information] in the Service of Ontario Engineering"
- (vi) 1974--"Science Policies for Ontario"
- (vii) 1975--"Utilization of Technical Manpower"
- (viii) 1976--"Productivity"

The Secretary of the OEAC is Dr. L.C. Sentance, Acting Executive Director of the APEO.

II.5.2 Committee of Ontario Deans of Engineering (CODE)

The Committee of Ontario Deans of Engineering is an informal liaison body that co-ordinates the policies of the various faculties

of Engineering of Ontario universities. CODE is linked with the Council of Ontario Universities (COU) (essentially the Presidents of the Ontario universities) and also with the Advisory Committee on Academic Planning ACAP. To COU, CODE reports regularly on enrolments and enrolment trends and on matters of programme development that may have been discussed at its meetings. With ACAP there is now a good flow of information, and useful consultation concerning graduate matters. Its membership includes the following persons:

- all deans of Ontario Engineering faculties
- a representative of the Association of Professional Engineers of Ontario
- Dr. L.C. Sentance, Acting Executive Director of the APEO presently acts as Secretary.

CODE is a body which has no actual authority to act on behalf of all the schools of engineering except on an ad hoc basis when all of the Deans are in agreement. The committee meets on an informal basis to discuss the broad range of issues that affect post-secondary engineering education. Some of the topics discussed by CODE include university curricula, research, manpower planning and accreditation. The committee will also independently commission research that will be of use to the universities. Thus Ring of Iron: A Study of Engineering Education in Ontario was jointly commissioned by CODE and the Council of Ontario Universities. CODE also liaises with the Ministry of Colleges and Universities and the APEO. Finally, CODE lobbies on behalf of engineering teachers qua members of the engineering profession. In this latter regard CODE was active in representing the interests of university professors vis a vis the APEO with respect to the following three controversies:

(i) From time to time there have been indications that the APEO would seek a change in the Professional Engineers Act that would include the teaching of engineering within the definition of "the practice of engineering." This change would effectively require all professors of engineering to become licensed members of the APEO. Over the years CODE has (successfully) campaigned against such a change.

(ii) Several years ago the Canadian Accreditation Board of the Canadian Council of Professional Engineers considered a recommendation of one of its subcommittees that would require that all courses which had been classified by the Canadian Accreditation Board as "engineering courses" (as opposed to "science courses") would have to be taught only by professors who were licenced members of the APEO. Again, CODE regarded such a move as an infringement upon the autonomy of the universities by the regulatory body and successfully campaigned against the implementation of such a policy.

(iii) When it appeared that the new "consultant designation" provisions enacted by the APEO might exclude university professors from being able to perform consulting work, CODE successfully made representations to the APEO to bring academics within the purview of the regulations.

II.5.3 National Council of Deans of Engineering and Applied Sciences

This liaison committee is the national equivalent of the Committee of Ontario Deans of Engineering. Its activities and interests are almost identical to those of CODE, except that the National Council liaises with the national association of provincial licencing bodies, the Canadian Council of Professional Engineers. One of the principal activities of the National Council is the co-ordination of university

curricula and policy in order to facilitate the portability of engineering educational requirements for licensing throughout Canada.

II.5.4 Engineers, Architects and Building Officials Liaison Committee (EABO)

The EABO Liaison Committee consists of representatives of the Association of Professional Engineers of Ontario, the Ontario Association of Architects and the Ontario Building Officials Association. The objects of the Committee are, inter alia, to coordinate the concerns that architects, professional engineers and building officials may have in respect of the substantive provisions, and administration, of national and provincial building codes.

II.5.5 Provincial Engineering Technology Consultative Committee

The Consultative Committee was set up at the instance of the Ministry of Colleges and Universities and includes representatives of the Ministry, the Colleges of Applied Arts and Technology, business and industry, the Association of Professional Engineers of Ontario and the Ontario Association of Engineering Technicians and Technologists. The purpose of the Committee is to provide advice to the Council of Regents regarding programme approvals and to advise on other areas as provided in its terms of reference.

II.6 Formal and Informal Interrelationships Between Professional Organizations

II.6.1 Common Membership

Members of the APEO are also members of the voluntary associations that exist in Ontario and Canada to advance the special business, economic and technical interests of professional engineers. Of course, membership in the APEO is a condition precedent to membership in these voluntary associations by virtue of the fact that The

Professional Engineers Act makes it an offence, inter alia, to hold oneself out as a professional engineer or to engage in the practice of engineering unless one is a member of the APEO. The voluntary associations include:

- Consulting Engineers of Ontario (By virtue of membership in the CEO, consulting engineers--and to some extent their employee-engineers--are represented at the national level by the Association of Consulting Engineers of Canada.)
- Engineering Institute of Canada
- Ontario Consulting Structural Engineers Association
- Municipal Engineers Association

Members of the APEO also belong to the following associations which include in their membership persons not belonging to the APEO:

- Canadian Construction Association
- Construction Specifications Canada
- Ontario Building Officials Association
- Federation of Engineering and Scientific Associations
- Ontario Association of Engineering Technicians and Technologists (While not large in number, some engineering technicians and technologists who have subsequently become professional engineers retain their membership in OACETT. On the other hand, technicians and technologists who contemplate applying for membership in the APEO may become "student" members of the APEO pursuant to section 13 of The Professional Engineers Act, and thereby are subject to the control of the Council of the APEO in accordance with the Act, the APEO Regulations and the By-laws of the Association.)
- the various technical bodies and learned societies listed supra in Section II.4.2.

Finally, the APEO itself is a constituent member of the Canadian Council of Professional Engineers, by virtue of which members of the APEO receive any benefits derived therefrom.

II.6.2 Formal Relationships

II.6.2(a) APEO/OACETT

As we have already described above in Section II.3.3, the OACETT developed as a representative of the interests of engineering technicians and technologists as a direct result of initiatives taken by the APEO. Indeed, the APEO largely controlled the operations of the OACETT during its nascency. It is only during the last few years that the OACETT has become functionally and administratively independent from the APEO. It is therefore not surprising that the APEO and the OACETT still maintain fairly close formal and informal relations. The most significant formal relationship between the two organizations is the APEO/OACETT Joint Liaison Committee. The Committee is composed of three members of each association and meets on a fairly regular basis to discuss the jurisdictional issue arising out of the necessity of defining the scope of practice of professional engineering.

II.6.2(b) Liaison Committees with the APEO

The following associations maintain fairly active liaison committees with the APEO:

- Consulting Engineers of Ontario
- Engineering Institute of Canada (which jointly sponsors with the APEO an annual conference known as ENGCON)
- Ontario Association of Architects

II.6.2(c) Canadian Council of Professional Engineers [of which the APEO is a constituent member] / Association of Consulting Engineers of Canada Bilateral Agreement

In an attempt to co-ordinate the activities and policies of Canadian engineering regulatory bodies and voluntary business associations of consulting engineers, the CCPE and the ACEC entered into a bilateral agreement in 1975 which formalizes the relationship between the two

national bodies and their provincial member associations and allocates responsibilities between the two groups .

II.6.2(d) Canadian Council of Professional Engineers/
Engineering Institute of Canada Bilateral
Agreement

The CCPE and the EIC have signed a bilateral agreement similar to that signed between the CCPE and the ACEC.

II.6.2(e) APEO/Committee of Ontario Deans of Engineering

A close relationship between the APEO and CODE exists by virtue of the fact that the APEO has an observer that attends all meetings of the Committee. In addition, the Acting Executive Director of the APEO, Dr. L.C. Sentance, is the Secretary of CODE.

II.6.3 Informal Relationships

II.6.3(a) APEO/OACETT

The informal relationships that have developed between the OACETT and the APEO are largely a product of OACETT's initial sponsorship by the APEO. The following list of informal relationships between the two organizations is by no means a comprehensive one, but does include the most significant informal connections:

- The elected officers of the two associations meet from time to time to discuss common problems.
- The executive directors and presidents of the two groups are invited to attend the meetings of their respective councils as observers.
- Local chapters of each association will sometimes have informal joint meetings to discuss professional matters.

II.6.3(b) APEO/CEO

The APEO and the Consulting Engineers of Ontario have extensive formal and informal relations. It will be recalled that the CEO was created out of a merger of the Consulting Engineers Division of

the APEO and the Ontario Chapter of the Association of Consulting Engineers of Canada. The offices of the CEO are situated in a building owned by the APEO and in which the offices of the APEO are also situated. The present Executive Director of the CEO, Mr. Ross Reid, is a former full-time staff officer of the APEO. Furthermore, the Consulting Practice Committee of the APEO--which develops the performance standards and fee schedules published by the APEO--is composed of consulting engineers, many of whom are also members of the CEO. Thus this informal institutional connection between the two associations is particularly beneficial to consulting engineers: the fee schedules are developed by the Consulting Practice Committee of the regulatory body and are then promoted to government and industry by the various liaison committees of the trade association of the consulting profession.

II.7 Collective Bargaining and Professional Engineers

II.7.1 History

Of all the professional groups being studied by the Professional Organizations Committee only the engineers are permitted by statute⁷² to bargain collectively.

The APEO's role in the history of engineering labour relations has three central characteristics. First, the APEO has consistently refused to act as a bargaining agent for employee-engineers, on the ground that to do so would seriously compromise its position as a professional regulatory body protecting the public interest. Second, the APEO has often taken the position in its representations to government that it is not desirable that professional engineers be granted the statutory right to bargain collectively. Note, for example, the following

passage from an APEO document entitled "For New Councillors--An Introduction to the Association":

....In 1943 the first mention of collective bargaining for professional engineers was made as a result of provincial labour legislation then pending. Discussions involving officers, council and a significant part of the membership have gone on almost steadily ever since and up until this time, through three generations of council members, all councils have been firmly opposed to the idea that compulsory collective bargaining might be the best course for professional engineers to follow.

Finally, the APEO throughout this history has tried to absorb within the confines of its own institutional framework independent employee-engineer organizations.

The history of collective bargaining in the engineering profession has been documented in Goldenberg, Professional Workers and Collective Bargaining.⁷³ What follows is a summary of the history of collective bargaining by Ontario professional engineers largely extracted from the Goldenberg paper and other sources.

The relevant Ontario labour relations legislation of the early 1940's--The Collective Bargaining Act, S.O. 1943, c.4 and The Labour Relations Board Act, S.O. 1944, c.29--permitted professionals to bargain collectively. The APEO actively lobbied against the inclusion of professional engineers in PC 1003, a 1944 wartime Order-in-council of the Federal Government dealing with collective bargaining. When the APEO failed to block that regulation, it encouraged the creation of the Federation of Employee Professional Engineers and Associates (FEPEA) and endorsed that Association as bargaining agent for professional engineers, promising to give all possible legal assistance to it.

In the post-war years, the Provincial Legislature decided to exclude professionals, including professional engineers, from collective bargaining legislation and enacted The Labour Relations Act, S.O. 1950,

c.34, s.1(3)(a). Subsequent to the enactment of that legislation, the APEO commenced its attempts to absorb the FEPEA, whose activities were now restricted to seeking voluntary recognition of professional engineer bargaining groups. The APEO set up a Liaison Committee and a Professional Status Committee, both of which tried to encourage the FEPEA to dissolve. Finally, the FEPEA was disbanded as the result of the formation of the APEO Employee Members Committee (EMC). The EMC consisted of representatives of the various so-called "Company Groups"--the former units of the FEPEA that had been certified as engineer bargaining units under PC 1003 and had continued to bargain collectively by employer recognition after compulsory collective bargaining legislation had been repealed. The terms of reference of the EMC did not include collective bargaining, but rather the EMC was restricted to establishing and maintaining communication with employers.

Throughout most of its history, the EMC did not maintain the best of relations with the Council of the Association. Specifically, the EMC sought to pressure the APEO to support changes in the legislation enabling professional engineers to collectively bargain once again.

The APEO continued to oppose collective bargaining under law for the

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following reasons:

- a) It can compel professional engineers to subordinate or indeed ~~abrogate~~ entirely their prime responsibilities to the public, to employer or client, and to other professionals.
- b) It can divide the profession, placing some members in a position of conflict of interest, leading to discord.
- c) It can, because of the confidential capacity of the engineer, weaken or restrict the free technical employment of professional persons.
- d) It can destroy the effectiveness of certain services now provided by the Association to its members.

- e) It can cause a complete reassessment of professional employment, with a major strengthening on the part of sub-professionals in the field.
- f) It can demean the profession in the eyes of its own members, their employers and the public.
- g) It can cause engineers to be associated with trade union philosophy, objectives and practices.
- h) It can, in fact, introduce each of the foregoing in the relationships of engineers with all of their associates, employers and the public at large.
- i) It can subvert self development and quality of service to the political or power aspirations of the few.
- j) It can lead to violation of public trust.
- k) It can lead to the use of the strike weapon.
- l) It can lead to effective control of the profession by trade union organizations.
- m) It can lead to determination of employment conditions by third parties not suitably informed of, or interested in particular employment situations.

When the APEO dissolved the EMC in 1969, that latter committee was replaced by the Employee Engineers Committee. The Employee Engineers Committee would necessarily prove more cooperative with the APEO Council for the EEC's membership consisted of one Councillor of the APEO and at least four members of the APEO appointed by Council. (The EMC, by way of contrast, consisted of representatives of Company Groups, who were, of course, independent of the APEO Council.) The terms of reference of the EEC are as follows:

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- The Employee-Engineers Committee shall:
- (a) provide a forum for the discussion of the particular interests of the employed engineer;
 - (b) recommend to the council policies and programmes relative to the affairs and the interests of the employed engineer;
 - (c) encourage and assist chapter committees which may have similar interests or projects;
 - (d) advise the council on matters relating to the practice of professional engineering by employed engineers, such as:
 - i) technical and professional development;

- ii) continuing education
- iii) utilization of technical manpower;
- iv) supply and demand for technical manpower;
- v) employment relationships and standards;
- vi) ethical practices; and
- e) with the approval of council, undertake studies for the purpose of enlarging the body of knowledge of the foregoing fields.

In the meantime, the Provincial Legislature was under continuous pressure to enable professional engineers to bargain collectively under law. The APEO was still opposed in principle to such a change. However when it seemed clear that the Government would amend the legislation, notwithstanding APEO opposition, the APEO made representations to the Government to permit collective bargaining only if professional engineers were not forced to be included in bargaining units which contained non-professional workers.

The relevant amendment to The Labour Relations Act reads as follows:
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A bargaining unit consisting solely of professional engineers shall be deemed by the Board to be a unit of employees appropriate for collective bargaining, but, the Board may include professional engineers in a bargaining unit with other employees if the Board is satisfied that a majority of such professional engineers wish to be included in such a bargaining unit.

II.7.2 Extent of Collective Bargaining by Professional Engineers

This researcher was not able to collect all existing data on the number of employee engineers who belong to bargaining units. Reference should be made to the FESA membership data reproduced above in Section III.3.2(a) and to the list of engineering bargaining groups provided to the Professional Organizations Committee by the Ministry of Labour.⁷⁷ These sources of information, however, do not necessarily represent the full extent of engineer unionization, for the groups listed therein are bargaining groups whose membership consists almost

exclusively of professional engineers. There may be other engineers who are members of a wider-based union organization. Neither the Ministry of Labour nor the Ontario Federation of Labour were able to provide this project with those figures. All parties agree, however, that relatively few engineers belong to traditional unions.

III. QUALIFICATIONS FOR, AND ENTRY INTO, THE PROFESSION

III.1 Introduction

As we have already seen in Section I.2 dealing with the history of regulatory legislation, the first Professional Engineers Act, in effect, created a system of "certification." Pursuant to the first Act, only members of the Association of Professional Engineers of Ontario could hold themselves out as a "professional engineers." The Act, however, did not prevent any person, whatever his qualifications, from engaging in the practice of engineering. It was not until the amendments of 1937⁷⁸ that licensing power was extended to the association. Thus, today, in order to carry on the practice of professional engineering in Ontario one of the following conditions must exist:

1) in the case of an individual residing or working in Ontario, he must be a registered member of the Association pursuant to section 11(1);⁷⁹ or

2) in the case of a partnership, association of persons, or corporation, it must hold a subsisting certificate of authorization issued by the registrar of the Association pursuant to section 20;⁸⁰ or

3) in the case of a person residing outside of Ontario, he must have been issued a licence pursuant to section 17.⁸¹

The licensing power of the Association directly flows from two of the objects of the Association as defined in section 3 of

the Act:

- a) to regulate the practice of professional engineering;
- b) ~~to~~ establish and maintain standards of knowledge and skill among its members.

The Act, however, makes it explicit that the powers have been conferred "in order that the public interest be served and protected" ⁸² This section, then, will examine both the requirements prescribed by statute, as well as the policies formulated by the APEO to control entry into the profession by means of

- 1) registration,
- 2) the issuance of certificates of authorization,
- 3) the designation of specialties, and
- 4) the licensing of non-Ontario residents.

III.2 Requirements for Registration

III.2.1 Non-Educational Qualifications

a) Age

An applicant for membership must be 21 years of age or more [s.11(b)].

b) Residence

An applicant must reside in Ontario [s.11(1)(a)(i)].

If he resides outside of Ontario, he must be employed for an indefinite period as a full-time employee of an employer having works or facilities within the province. Furthermore, the terms of the non-resident applicant's employment must require him to practice professional engineering in respect of his employer's works or facilities [s.11(1)(a)(ii)].

c) Character

Section 11(1)(e) requires the applicant for membership to provide "satisfactory evidence of good character." The Act requires

at least three references as to the applicant's character and engineering experience. The APEO registrar has indicated that no applicant has ever been refused admittance to the association on the basis of failing to provide evidence of "good character."

d) Other Non-Educational Requirements

The Act does not specify any non-educational entry qualifications other than age, residence and good character. An applicant need not be a Canadian citizen to gain entry into the profession - although as we have seen, a person must be either a Canadian citizen or other British subject to be appointed or elected to the Association Council. However, there does seem to be general agreement among APEO officials that there ought to be some mechanism for excluding a person suffering from emotional and psychological problems which would adversely affect his ability to function properly as a professional engineer. No such mechanism presently exists.

e) Professional Interviewing Committee

The Professional Interviewing Committee is a committee appointed annually by the Association Council according to APEO By-law No. 2. The committee serves two functions. First, if the academic training of an applicant for membership was conducted in a language other than French or English, the registrar may refer that person to the committee in order that the committee may interview the applicant to determine his language proficiency. The committee then reports its findings to council, and if council is satisfied that the applicant is not sufficiently fluent in either English or French his application may be deferred.

Second, the committee also interviews applicants referred to it

by the registrar if a question requiring clarification has been raised by the references submitted or by another reliable source as to the character and engineering experience of the applicant. Having given the applicant an opportunity to respond, the committee then makes recommendations to council on its findings.

III.2.2 Academic and Experience Qualifications

III.2.2(a) Introduction

As we have already noted, one of the objects of the Association as defined by statute is to "establish and maintain standards of knowledge and skill among its members" [s.3(3)(b)]. Thus, two important academic and experience qualifications for membership have been prescribed by The Professional Engineers Act. First, an applicant must have passed the examinations prescribed by council or have been exempted from writing such examinations [s.11(1)(d)]. Section 7(1)(a) permits the council to make regulations prescribing the scope and conduct of examinations of candidates for registration. Section 11(3) gives the council power to exempt an applicant from any of the prescribed examinations "if the council is of the opinion that the applicant has adequate academic and other qualifications."

The second prerequisite for membership is that an applicant must have had six or more years of experience in engineering work satisfactory to the council [s.11(1)(d)]. However, graduates of recognized universities may be granted an exemption of up to four years from this work experience requirement [s.11(4)].

III.2.2(b) The Process of Assessing the Academic and Experience Qualifications of an Applicant

Before describing the policies developed by the APEO with respect to academic and experience requirements for membership, we will examine

the administrative means by which the council processes an application for membership. The workings of the Professional Interviewing Committee have already been discussed briefly. This section will examine the functions of the council, the registrar, the Board of Examiners and the Appeal Board.

i) The Council

Section 11 of the Act provides that the council of the Association itself must formally admit applicants as members of the Association. It is the council's duty to examine the qualifications and experience of any particular candidate and to decide whether or not the candidate is to be admitted. However, because of the large number of applicants each year, the council requires assistance in evaluating the eligibility of each individual applicant. To that end, the council has delegated many of its evaluative functions to the registrar, the Board of Examiners, and the Appeal Board. In the usual case the council will follow the recommendations of these officers with respect to the admittance of applicants.

ii) The Registrar

Pursuant to section 5(a), the council must appoint a registrar. The registrar's role has both an administrative and a "quasi-judicial" component. All applications for membership are initially received and processed by the registrar. The registrar and his staff will evaluate the applicant's academic and experience record. He may then recommend to council that the applicant be given total, partial, or no exemption with respect to academic and experience requirements for membership. In his discretion, he may also refer the application to the Board of Examiners so that it may design an acceptable examination

programme, or he may refer the application to the Appeal Board so that body may assess his experience and qualifications.

iii) Board of Examiners

The Act requires the council to appoint annually a Board of Examiners [s.21(1)]. As defined by statute the Board may evaluate and make recommendations to council with respect to any application for exemption [s.11(5)]. Pursuant to its powers to pass by-laws defining the composition and functions of the Board of Examiners [s.7(1)(j)], the council enacted by-law No.2, section 3. The Board of Examiners may assess the academic qualifications of applicants referred to it and make recommendations to council regarding an appropriate examination programme [By-law No.2, s.3(1)]. The Board may also interview applicants for membership referred to it by council, or by the registrar, or who have submitted additional evidence justifying a review of their academic qualifications. Finally, the Board makes policy recommendations to council with respect to the content of the APEO examination system, makes administrative arrangements for the setting of the examinations, and also makes recommendations to council regarding the approval of the content of examination papers.

The functions of the Board of Examiners, therefore, are directly related to the jurisdiction of the council of the APEO both to prescribe examinations for applicants and to exempt applicants otherwise adequately qualified from writing such examinations.

The membership of the Board of Examiners is as follows: ten university professors, one college master, and two industry representatives.

At each meeting of the Board in September, it appoints

a group of examiners (who are usually university professors) to set the papers in each of the APEO examination subjects. When the papers are set, the Board examines each paper to ensure that it conforms to the content of the syllabus (which contains about seventy individual subjects) and that it conforms to an accepted level of difficulty.

It is important to note that the Board of Examiners, with respect to its function of evaluating the record of an applicant, is restricted to assessing formal education only. In this assessment function, the Board does not take into consideration either the age of the applicant or his previous engineering experience. If the Board feels that, while the programme set by it is technically correct, such a programme may be unfair because of the applicant's work experience, it may refer the programme to the Appeal Board. The Appeal Board, which may then interview the applicant with respect to his work experience, may either confirm, change, or completely reject the findings of the Board of Examiners.

iv) The Appeal Board

As we have seen, the jurisdiction of the Board of Examiners extends only to the evaluation of the academic qualifications of applicants referred to it. The Appeal Board, however, does not evaluate academic qualifications per se, but rather evaluates the experience component of the applicant's qualifications.

The Appeal Board exists by virtue of section 4 of By-law No.2. It is a committee appointed annually by council. Its powers are defined in sub-sections 4(2) and 4(3) of by-law No.2 as follows:

s.4(1) ...

(2) If the educational qualifications of an applicant for

membership have been found to be deficient in engineering subjects required for full exemption from the examinations prescribed by the Council, and if such applicant has academic qualifications in a field of science, or has had experience of such length or such record of accomplishment and level of responsibility in a field of engineering, as to indicate that his qualifications in these respects are significantly in excess of the minimum requirements of the Act, the application of such applicant may be referred to the Appeal Board for review.

- (3) The Appeal Board may interview all applicants for membership referred to it by the Council or by the registrar or who have made application for such interview, shall consider the qualifications of such applicant by assessing the educational deficiencies in engineering subjects in the light of the qualifications of the applicant in excess of the minimum requirements in other respects, and shall make recommendations to the Council.

The powers of the Appeal Board flow directly from the jurisdiction of the council of the APEO to develop criteria determining which types of engineering experience will satisfy the six year period prescribed by section 11(1)(d) of the Act.

III.2.2(c) Acceptable Academic Qualifications

(i) Accredited University Programme

The majority of persons wishing to gain entry into the APEO will do so by obtaining a degree in engineering in a university programme recognized by the APEO. If the applicant follows this route, he will be exempted from writing the APEO examinations and will be granted membership after he has fulfilled the two-year experience requirement (and, of course, fulfills the non-academic requirements discussed above).

Canadian Universities

Prior to 1970, the APEO had a standing committee of its council known as the Accreditation Committee. The Committee's function was to evaluate periodically the engineering programmes of all Ontario universities. The Committee would visit the universities (at their invitation) and examine the contents of courses, and evaluate the

quality of the faculty, library facilities, lecture rooms, laboratories, examinations, etc. The Committee would then make its findings known to the council and make recommendations with respect to the extent to which the university programmes conformed with the admission standards of the APEO. If necessary, the Committee would also recommend changes in the curriculum that would bring the course up to the APEO's standards. The council would then consider the recommendations of the Committee and decide if a particular university programme fulfilled the APEO requirements.

In 1965, the Canadian Council of Professional Engineers, of which the APEO is a member, established the Canadian Accreditation Board. The objectives of the Board are defined in its terms of reference:⁸³

1.1 To promote in co-operation with the [provincial regulatory] associations...uniformity of accreditation of educational qualifications for purposes of registration in the Canadian provinces and territories to the greatest degree practicable.

1.2 To foster in cooperation with the educational institutions a high standard of engineering education in Canada.

1.3 To provide a medium for the interchange of ideas between the universities and the profession as to the educational needs of the profession.

1.4 To assist the provincial associations...in the interest of uniformity of practice, in the assessment of foreign engineering educational qualifications.

In general, each university programme undergoes periodic review every five years. The process by which the Board accredits university programmes of Canadian schools is described in detail in the first Annual Report.⁸⁴ While the Board accredits only the programmes of Canadian universities, it does provide information to provincial associations with respect to programmes in foreign universities. In 1970 the Accreditation Committee of the APEO was dissolved and the APEO decided to follow

the accreditation policy of the Canadian Accreditation Board. The APEO, however, has not abdicated its responsibility with respect to its duty to evaluate Canadian university curricula, for the APEO is a constituent member of the Canadian Council of Professional Engineers and has direct input into the formulation of accreditation policy at the national level. In addition, the APEO registrar attends all Canadian Accreditation Board meetings as an observer. In general, then, any course accredited by the CAB is usually recognized by the council of the APEO.

If a potential applicant wishes to find out if his particular programme conforms to the APEO admission requirements, the only certain way of verifying this fact is to contact the registrar of the APEO personally. Sometimes this information is printed in university calendars -- but not always. The applicant might purchase the CAB list, but he still must make sure that his particular programme is accredited by the APEO. The APEO itself does not publish a list of accredited courses.

Non-Canadian Universities

As we have seen, the Canadian Accreditation Board does not formally accredit non-Canadian university programmes. Thus, because of the dissolution of the APEO Accreditation Committee, the function of examining the programmes of foreign schools has been taken over by the Board of Examiners. In this regard, the Board of Examiners determines if a degree granted by a foreign university is substantially the same as one granted by a Canadian University. The policies formulated with respect to United Kingdom graduates and United States graduates may be found in the Registrar's Reference Papers, Section 6.

(ii) The APEO Examination System

If an applicant's academic qualifications fall short of the APEO's requirements for registration, he will have to pass the examinations set annually by the APEO. Thus, only those persons possessing engineering degrees recognized by the council are admitted to membership in the Association without written examinations. Most others will have to pass an APEO examination programme specifically designed to correct the academic deficiencies in an individual applicant's engineering education.

Admission into the Examination System

Until December 31, 1970 admission into the APEO examination programme was generally granted to persons possessing qualifications that would admit them at least into the first year of a 4-year degree course at an Ontario university. Thus, only persons holding a Senior Matriculation or its equivalent were eligible to write the APEO examinations. In 1970, however, the council adopted a plan which would phase out the APEO examination system in seven one-year stages. As a matter of policy, the council decided that the essential academic requirement for entry into the profession would be a university degree in engineering. It was envisaged that after the complete integration of the so called "seven-year plan" the only examinations to be administered by the APEO were to be "confirmatory exams" (which are described in more detail below) given to applicants having a degree not recognized for complete exemption. The two guiding principles upon which the
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seven year plan was based were:

- 1) The present APEO examination system consists of a very inefficient educational system. It has an extremely high failure rate and constitutes a poor educational experience for its students. Therefore, it should be discontinued.

2) Engineers should be educated by the engineering schools. The requirement of an engineering degree for entry into the registration system was chosen since it assures that, in most cases, the applicant has received the desired experience in an engineering school, and because it corresponds approximately to levels of professional qualification existing in other provinces and in most countries of the world.

The seven-year plan consisted of the following steps:

1. First Year of the Plan, January 1st, 1971 until December 31st, 1971. During this year, applicants will continue to be accepted into the examination system on the same basis as in the past, i.e. senior matriculation or its academic equivalent. Such persons can expect to be required to pass all of the examinations in the syllabus pertaining to their chosen branch of engineering, and are given seven years in which to do so, provided that a satisfactory level of performance in the examinations is maintained. All persons who are currently in the examination system will be unaffected by this new policy. The conditions as to time limitations, performance in the examinations etc., of which they were notified upon admission to the examination program, remain in effect.
2. Second Year of the Plan, January 1st, 1972 to December 31st, 1972. During this year, applicants will continue to be accepted into the examination system with the same academic qualifications as before, but the maximum time they will be permitted to complete the examinations will be six years.
3. Third Year of the Plan, January 1st, 1973 to December 31st, 1973. During this year, applicants will be accepted into the examination system only if they possess the qualifications of an Engineering Technologist (either through having graduated from a three-year engineering technology program following Ontario Grade 12, or through having become certified as Engineering Technologists by the Ontario Association of Certified Engineering Technicians and Technologists) or higher.

The maximum time they will be permitted to complete the examinations will be five years.
4. Fourth Year of the Plan, January 1st, 1974 to December 31st, 1974. During this year, applicants will be accepted into the examination system if they possess the same qualifications as under 3 above, the maximum time allowed for the completion of the examinations being four years. Such candidates should be aware that they will probably have to pass at least two and more likely three papers a year, in order to complete their examinations within the allotted time.
5. Fifth Year of the Plan, January 1st, 1975 to December 31st, 1975. During this year, applicants will be accepted into the examination

system if they possess the same qualifications which would have admitted them into the third or fourth year of a recognized 4-year engineering course at an Ontario university. The maximum time they will be permitted to complete the program will be three years. Such candidates should be aware as in 4 above, of the necessity of passing two or three papers a year in order to complete their examinations within the allotted time.

6. Sixth Year of the Plan, January 1st, 1976 to December 31st, 1976. During this year, applicants will be accepted into the examination system only if they possess qualifications which would have admitted them into the fourth year of a recognized four-year engineering course at an Ontario university. The maximum time they will be permitted to complete the examinations will be two years.
7. Seventh Year of the Plan, January 1st, 1977 to December 31st, 1977 and henceforth. Only those applicants who possess an engineering degree, granted by a university which is not specifically recognized by the Association for complete exemption from the examinations, will be admitted into the examination system. Such candidates will be required to pass the "confirmatory examinations" within two successive examination sessions, in accordance with present regulations pertaining to such examinations.

In 1973, the seven-year plan was "frozen" by council at the third year of its operation upon the recommendation of the Board of Examiners.⁸⁶ Therefore, since that time, the minimum requirements for entry into the APEO examination system has been the possession of qualifications of an engineering technologist. Normally, this term is interpreted to include two classes of persons:

- 1) graduates from a three year engineering technology programme from one of the Colleges of Applied Arts and Technology (following grade 12); or
- 2) persons certified as engineering technologists by the Ontario Association of Engineering Technicians and Technologists (or eligible for certification).

The principal factor which caused the council to freeze the seven-year plan at this stage was the Report of the Commission on Post-Secondary Education in Ontario (COPSEO) which appeared in 1970. In

this regard two of its recommendations with respect to increasing access to professional occupations ran counter to the APEO plan of limiting access to the practice of professional engineering to persons possessing an engineering degree. Two of the COPSEO recommendations are of particular significance. Recommendation number 54 provided that "[a]dmission to professional practice in Ontario should be solely on the basis of an assessment of knowledge and performance undertaken at the point of entry into the profession." Recommendation number 55 provided that "[t]o promote equality of access to the professions, the Government of Ontario should consider enacting legislation that, in suitable cases, prohibits the use of set programmes of formal education as a requirement for the taking of professional and paraprofessional licensing examinations." The APEO Council was of the opinion that to require that candidates hold the qualifications of an engineering technologist as a prerequisite to entry into the APEO examination system was not inconsistent with the access recommendations of the COPSEO Report. Given the proliferation of Colleges of Applied Arts and Technology throughout Ontario, it would be relatively easy for any person wishing to take the APEO system of examinations to obtain the minimum entry requirement from one of the community colleges.

The Content of the APEO Examination System

As we have already mentioned above, each examination programme is individually designed to complement the academic deficiencies of the particular applicant. The syllabus used is the one developed by the Canadian Council of Professional Engineers. This syllabus is also used in most of the other provinces. In this way, the academic standards of each province are substantially similar in content. This

increases the geographical transferability of engineering training and licensure.

There are two major sections of the examination programme. Section one is a group of examinations entitled "Engineering Fundamentals." This set of examinations tests the candidate on general background in the basic skills in mathematics, chemistry and physics required of an engineer in practice. Section 2, entitled "Professional Examinations," contains two parts. Part A is common to all branches of engineering. It includes a series of two examinations, one in professional practice, and another in engineering economics, law, management and specifications. In addition, a candidate may be required to submit a thesis or study report on a particular subject within his own branch of engineering. Part B consists of a set of examinations specific to each branch. At present there are nine branches of engineering in which examinations are given by the APEO: chemical, civil, electrical, geological, mechanical, metallurgical, mining, agricultural and industrial. These syllabi are contained in the Reference Papers of the registrar.

As we have already stated, each applicant's academic background is considered individually, and an examination programme is developed on an ad hoc basis. The registrar and the Board of Examiners, however, have developed some "rules" of consistency in programme formulation with respect to applicants having very similar academic backgrounds. When a rule does exist, it is usually applied (i.e. about 90% of the time) by the Registrar. The Registrar, in practice, may refer applicants to the Board of Examiners if he feels that the applicant's academic training and experience are such that he ought not to be required to write all

of the examinations normally covered by the rule.

The first, and perhaps most important, rule is that dealing with graduates of universities not recognized for complete exemption. (This rule applies only to university graduates and not to graduates of the Colleges of Applied Arts and Technology or other non-university post-secondary technical institutions.) In the case of such applicants, the standard procedure is to assign a set of "confirmatory examinations." Confirmatory examinations consist of a set group of 4 examinations: the examination in professional practice, the examination in engineering, economics, law management and specifications; and two 3-hour papers chosen from the professional examinations (outlined in the syllabus) of the branch in which the applicant wishes to be registered. If the applicant passes all four confirmatory examinations on the first attempt and obtains an average of at least 55% on the two "branch examinations," the candidate will be admitted to registration without having to write further examinations. All of the examinations need not be written in the same year.) If, however, the candidate does not successfully complete the confirmatory examinations, his application will be referred back to the Board of Examiners, which may decide to impose further examination requirements.

Other policies have been formulated with respect to United States and United Kingdom applicants. In general graduates of American universities accredited by the United States Engineers Council for Professional Development are granted a full exemption from the APEO examinations. Similarly, full exemption is generally granted to graduates of honours degree courses at United Kingdom universities and to fellows and corporate members of constituent member-institutions

of the U.K. Council of Engineering Institutions. These rules may be found in full in the Registrar's Reference Papers, section 6.

The Registrar and the Board of Examiners are at present in the midst of developing rules to be applied to applicants holding a diploma in technology. At present, it is a rare case that the courses taken in satisfaction of a diploma in technology are accepted as fulfilling in toto a subject on an applicant's APEO examination programme which has been set by the Board. On the other hand, in setting the APEO programme the Registrar and the Board of Examiners may in some cases grant an exemption from an examination the content of which has been adequately covered over a sequence of diploma curriculum courses.

Writing the Examinations

The development of the "seven-year plan," as we have already seen, was based upon the principle that the APEO, as a registration and examining body, ought not to be involved in the actual education of engineers. Because of the APEO's concern about unduly limiting access to the profession, the APEO has decided, for the moment, not to totally phase out its system of examinations. Thus, the majority of examination papers are still set and administered by the APEO. Once a programme has been designed for an applicant he is provided with a syllabus for each examination which he is required to write. The APEO does not provide any instruction whatsoever. It is the applicant's responsibility to master the contents of the syllabus on his own initiative. (However, he may hire his own private tutor.)

The procedure on writing examinations is contained in the regulations.⁸⁷ At present there are 14 examination centres throughout the province. Examinations are usually held each April. Each candidate

must pay an initial examination fee of \$75.00 and a fee of \$35.00 for each paper. The candidate must present himself to write his first examination within two years of being notified by the Registrar of his examination programme. Thereafter, the applicant must satisfy all of the examination requirements within a period of five years. In special circumstances (for example, due to illness or personal problems) these time limits may be extended at the discretion of Council.

A person may rewrite any number of examinations which he has failed. If, however, a candidate does not satisfactorily complete the examination programme within the time limit, his file is usually closed and his application may be withdrawn by the Registrar. However, he may reapply for membership in the Association. For this purpose, his application is treated as a totally new application and he must again pay the prescribed fees. While he may be given a totally new examination programme, the council may take into consideration the examinations that the applicant has previously passed.

It should be noted that not every examination of the APEO syllabus is administered by the APEO itself. As a result of the first three years of the seven-year plan, some examinations are solely administered by the community colleges and the universities. Unlike the APEO administered examinations, classroom instruction is available for those examinations administered by the colleges and universities. The Colleges of Applied Arts and Technology now provide instruction in the fundamentals of engineering. The APEO no longer administers these examinations. This set of examinations is specifically designed for APEO applicants and is not integrated into the regular programme of the community colleges.

During the last several years, the APEO has successfully negotiated with the Departments of Continuing Education of the Faculties of Engineering of the Universities of Toronto, McMaster, Waterloo, Queen's and Carleton to have these institutions provide instruction in and administration of approved APEO examinations. Once an applicant has been accepted into the APEO examination system, he need not possess the minimum qualifications to enter a regular engineering programme at these universities. These APEO examinations, like those given by the community colleges, are separate and distinct from the regular university curriculum. Some universities, however, have permitted APEO applicants to register as external students in some of the regular courses which satisfy APEO examination requirements.

As a matter of policy the APEO council has decided that in general APEO examinations may not be written abroad. However, there is one exception to this general rule: if an applicant has written at least one exam in Ontario, but prior to finishing the remainder of his examination programme is forced to move outside of Ontario (usually for business reasons), he may be given permission to attempt the remaining examinations outside of Ontario if he can find a registered Ontario Professional Engineer to supervise the writing.

In the case of an examination candidate who has not written one examination but is sent abroad for business reasons he may be granted one concession: the time limit within which he must complete his APEO examination programme may stop running while he is outside of Ontario.

Data re Numbers of Persons Registered through the
APEO Examination System

The APEO does not keep any data with respect to the numbers

of persons who have become registered as professional engineers through the APEO examination system (as opposed to having become qualified through the university route). When Council is presented with the lists of persons who are academically qualified it does not know whether or not a person has become qualified through the examination system or through study at university. This information, however, may be generated if necessary by going through each individual applicant's file. At our request, the APEO did provide the Project with such information for the year 1976. In that year 148 persons who had received their engineering education through the examination system were admitted as members, in contrast to 2513 who had graduated from accredited university engineering programmes.

III.2.2(d) Acceptable Experience Requirements

As we have already seen, The Professional Engineers Act requires at least six years of experience in engineering "satisfactory to the council" as a condition precedent to registration. [section 11(1)(d)]. A graduate of a university may receive an exemption of up to four years in reduction of the six-year period for time spent as an undergraduate in the university programme [section 11(4)]. The type of engineering experience that the council considers satisfactory to meet the statutory requirement may be found in "Experience in Engineering Work Satisfactory to the Council," Registrar's Reference Papers, Section 3.

It should be noted that the council may exempt persons from the experience requirement where they have had satisfactory engineering experience in another jurisdiction. Similarly, while there is no explicit statutory power to do so, the council may grant

an exemption of one extra year for persons who have completed a master's degree in engineering. The council has also decided that, as a matter of policy, it will not grant an additional exemption for time spent in doing practical engineering work within the degree programme at the University of Waterloo, which has a "Co-operative Work Programme" consisting of both classroom work and practice in an engineering office. Finally, persons who have successfully completed the APEO examination programme may be granted an exemption for time spent as engineering technicians and technologists prior to the completion of their examinations.

III.2.2(e) Reciprocal Membership Rules

Section 12 of the Act provides that upon satisfactory proof of residence, the council may admit as members two classes of persons who are registered professional engineers outside of Ontario:

- 1) members of an Association of Professional Engineers in another province or territory of Canada; and
- 2) members of an Association of Professional Engineers in another part of the Commonwealth or in the United States of America.

The Act further provides that such non-Ontario Associations of Professional Engineers must have "objects similar to those of the Association and requirements for membership no less exacting than those in effect in Ontario."

III.2.2(f) The Process of Registration and Annual "Re-Registration"

Once an applicant meets all of the requirements of section 11, the council is under a statutory duty to admit him as a member of the APEO. Having paid his fee for application and his registration

fee (which was \$35.00 during 1976, but was increased to \$45.00 as of January 1st, 1977) the member will receive a certificate of membership bearing the seal of the Association [s.23(1)] - this certificate must be prominently displayed in the member's place of business [s.23(1)] - and will also receive his professional engineer's seal. No re-registration process is required. All that a member must do to remain a member is to pay his annual fee. The member is not reissued a new certificate or seal each year. It should be noted that according to the APEO Council's interpretation of the Act, a person does not have to remain resident in Ontario in order to remain a member of the Association.

Non-payment of the annual fee within a certain time limit set by section 14(2) may allow the Registrar, at the direction of the council, to delete the member's name from the register. A member's name may also be deleted from the Association (s.15). In both of these cases, the former member may be reinstated upon payment of fees owed at the time he ceased to be a member and of the fee for the current year, and upon the production of evidence of good character (s.16). The Act does not require the reinstated member to be a resident of Ontario at the time of reinstatement. Nor does the Act require any type of educational or experience requalification.

III.2.2(g) Quarterly Reports to the Lieutenant Governor in Council

Section 22(4) of the Act requires that the Registrar submit to the Lieutenant Governor in Council four times each year a list of the following names of persons:

- (a) those granted partial exemption from examinations;
- (b) those granted no exemption from examinations;

- (c) those refused permission to write examinations; or
- (d) those not admitted to membership in the Association because,
 - i) their experience in engineering work was not satisfactory to the Council, or
 - ii) they did not provide satisfactory evidence of good character.

III.2.2(h) Appeal Where Membership Refused

Section 24(1) provides that "where an applicant for membership for a licence has met the academic and experience requirements, or an applicant for restoration of his name on the register has paid the required fee and has produced the required evidence of good character, and his application is refused, the council shall, upon the written request of the applicant received by the Registrar within fifteen days of the receipt by the applicant of written notice of the refusal, conduct a hearing of the matter." The procedures to be used at this hearing are the same as those used in hearings upon disciplinary matters as prescribed by section 25 [s.24(2)]. It should be noted that upon a strict reading of section 24(1) no right of appeal exists with respect to any decision taken by Council regarding academic or experience requirements only. However, upon the advice of its legal counsel, the APEO Council has set up an informal system of appeal to the Board of Examiners with respect to failure of APEO examinations, and to the Appeal Board regarding Council's refusal to grant an exemption for work experience. It should be noted that this informal appeal is in fact not really an appeal but rather a petition for reconsideration of the council's previous decision.

Figure F.III.4 presents a schematic illustration of the process of assessing an individual's application for membership.

III.3 The Licensing of Partnerships, Associations of Persons and Corporations: The Certificate of Authorization

Neither partnerships, associations of persons nor corporations may become registered members of the Association of Professional Engineers of Ontario [s.20(1)]. The title "Professional Engineer" may only be adopted by a natural person. On the other hand a partnership, an association of persons and a corporation may practice professional engineering in its own right provided that it is granted permission to do so by the APEO. The licensing mechanism used to control the practice of engineering by these non-human entities is called a "certificate of authorization". The legislative authority for the issuance of a certificate of authorization is found in section 20 of The Professional Engineers Act:

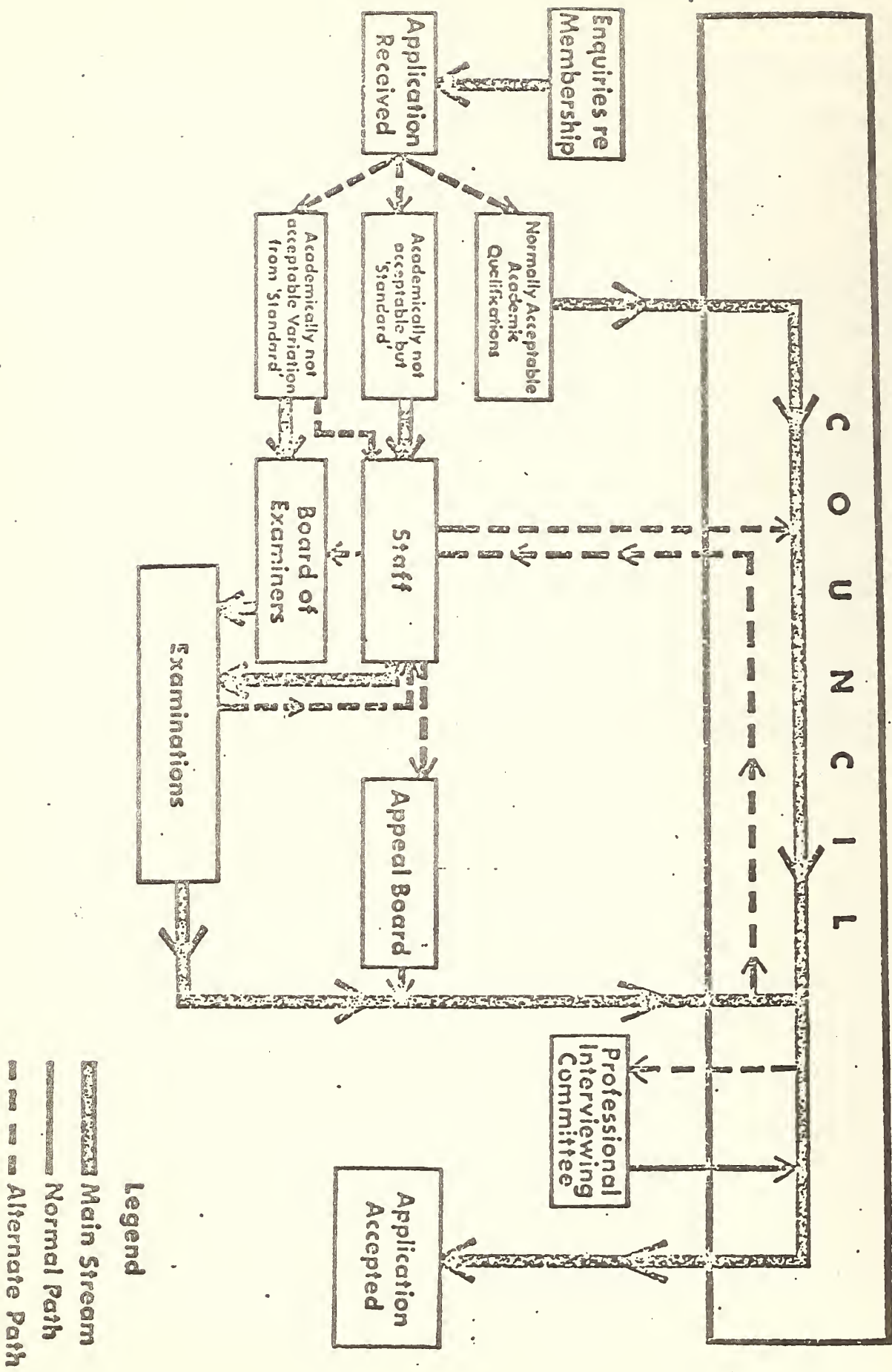
20.—(1) No partnership, association of persons or corporation as such shall be a member or a licensee, or shall, except as authorized by this section, practise professional engineering.

(2) A partnership, association of persons or corporation that holds a certificate of authorization may, in its own name, practise professional engineering,

- (a) if one of its principal or customary functions is to engage in the practice of professional engineering; and
- (b) if the practice of professional engineering is done under the responsibility and supervision of a member of the partnership or association of persons, or of a director or full-time employee of the corporation, as the case may be, who,
 - (i) is a member, or
 - (ii) is a licensee, in which case the practice of professional engineering shall be restricted to the work specified in the licence of the licensee.

FIGURE III.4

SCHEMATIC ILLUSTRATION OF APEO PROCEDURE ON APPLICATION FOR MEMBERSHIP



(3) A partnership, association of persons or corporation that desires a certificate of authorization shall submit to the registrar an application in the prescribed form containing,

- (a) the names and addresses of all its partners, members, officers or directors, as the case may be;
- (b) the names of all its partners, members of associations of persons, directors of corporations, or full-time employees of corporations, as the case may be, who are the members or licensees who will be in charge of professional engineering on its behalf;
- (c) from among the names specified under clause b the name or names of its official representative or representatives whose duty it is to ensure that this Act and the regulations and the by-laws are complied with by the partnership, the association of persons or the corporation, as the case may be,

and shall, whenever there is a change in the particulars given in its application, give notice of the change to the registrar within thirty days after the effective date of the change.

(4) If subsection 3 is complied with, the registrar shall issue to the applicant a certificate of authorization.

(5) Where the holder of a certificate of authorization ceases to have any official representative, the certificate is *ipso facto* revoked, and the partnership, association of persons or corporation shall not practise professional engineering until a new certificate of authorization is issued.

(6) Where the council finds that the holder of a certificate of authorization has failed to observe any of the provisions of this section or has been guilty of conduct that would, in the case of a member or licensee, have been professional misconduct, the council may reprimand the holder or suspend or revoke the certificate of authorization.

(7) Sections 24, 25 and 26 apply *mutatis mutandis* to the refusal to issue a certificate of authorization and to the revocation or suspension of a certificate of authorization.

It should be noted that unlike the admittance of members into the Association and the granting of temporary licences to non-members, the registrar, and not the Council, determines the question of whether or not the applicant is qualified to receive a certificate of authorization. If the applicant comes within the provisions of section 20(3), the registrar has no discretion to refuse to issue the certificate of authorization [s.20(4)].

Once issued, the certificate of authorization is valid for the remainder of that calendar year and thereafter is renewable annually each January [By-law No. 1, s.94(3)]. Pursuant to section 94(4) of By-law No. 1, the Association maintains and publishes a listing of the firms and corporations which have received certificates of authorization to practice professional engineering in Ontario. This "Directory of Firms and Corporations" serves two important functions. First, it informs the consumers of engineering services of the firms and corporations which may legally practice professional engineering. Second, it allows members of the association to determine quickly if a firm or corporation is allowed to offer engineering services. If the name is not listed in the directory, the member may then report this contravention of the Act to the Association so that appropriate enforcement proceedings may be taken.

Some persons are at present attempting to avoid the necessity of obtaining a certificate of authorization by forming a "partnership of corporations." This entity is not specifically mentioned in section 20. Data is obtainable from the APEO detailing the number of certificates of authorization granted.

III.4 Temporary and Limited Licences

III.4.1 History

The first Professional Engineers Act, R.S.O. 1922, c.59, s. 17 authorized the APEO to issue "temporary" or "limited" licences to registered members of other provincial associations [s.17(1)] and to consulting specialists who were not resident in Canada. [s.17(2)]. These provisions for the issuance of temporary or limited licences have remained basically unchanged in the present legislation (which will be discussed in greater detail below). In earlier times the Council was somewhat more concerned officially than it is now with the fact that Ontario and Canadian engineers were losing a large share of the consulting market to non-Canadian (principally American) consultants. For example, at one time the employer of a non-Canadian applicant for a licence received a form letter from the Association which outlined the applicant's qualifications and the nature of the project and suggested that, since appropriate engineering expertise existed in Ontario and Canada, the employer might give serious consideration to employing Canadian engineers in the future. With the change in the Act in S.O. 1968-69, c.99, s.3(3) clearly stating that the objects of the Association are to serve and protect the public interest, the Council of the APEO no longer considers it proper (notwithstanding some opposition from consulting engineers) to utilize its licensing function to advance the business interests of Ontario engineers in this manner.

III.4.2 Scope of Practice Pursuant to a Licence

The extent of limited licensure reflects the high degree of foreign ownership in the Canadian economy. For example, a great many

licences are issued with respect to industrial design. It is often economically and functionally more efficient for a Canadian subsidiary of an American corporation to import the engineering staff from its home office rather than hire an Ontario or Canadian consultant to carry out the work. A licence is limited to a specific employer and a specific project or a specific class of designs. Section 17(5) of the Act provides that:

The registrar shall issue a licence in the prescribed form to any person entitled thereto and shall specify therein the work upon which and the name of the employer in Ontario by whom the holder of the licence is to be employed and the period for which it is issued, but in no case shall the period extend beyond the end of the calendar year in which the licence is issued.

Thus, a licensee may not provide engineering services generally; he must obtain a licence for each project upon which he intends to work. To be able to provide general engineering services, the person must become a member of the APEO pursuant to section 12.

III.4.3 Licensure of Canadian Residents not Living in Ontario

Section 17(1) of The Professional Engineers Act authorizes the registrar to issue a licence to members of other provincial engineering associations:

The registrar may upon application issue a licence to any person who resides in Canada but not in Ontario and who furnishes satisfactory proof that he is a member of an association of professional engineers in another province or territory of Canada that has objects similar to those of the Association.

A similar provision obtains with respect to provinces or territories which do not have an association of professional engineers [s. 17(3)]:

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Any person practising or proposing to practice professional engineering in Ontario who resides in a province or territory of Canada in which there is no association of professional engineers that has objects similar to those of the Association, may, with the approval of the council, be issued a licence.

III.4.4 Licensure of Non-Canadian Residents

The statutory provisions empowering the APEO to licence non-Canadian resident engineers are contained in section 17(2) of the Act:

Any person who does not reside in Canada but who in the opinion of the Council is a consulting specialist in a field of professional engineering who has had not less than ten years experience in the practice of this profession, or who furnishes satisfactory evidence that he has qualifications at least equal to those required for registration as a professional engineer in Ontario, may, with the approval of the Council, be issued a licence.

The licensure of persons not resident in Canada differs in one important respect from the licensure of Canadian residents. With respect to the former class of persons only Council of the APEO approves the issuance of the licence, while with respect to the latter the registrar may do so.

In considering whether a person is a "consulting specialist" within the meaning of section 17(2), the Council will consider the individual's education, experience and personal background. Similarly, in determining if the individual possesses "qualifications at least equal to those required for registration as a professional engineer in Ontario" the Council will take into consideration the applicant's age, education, engineering experience and general character, as prescribed by statute in section 11(1). These are the only factors that may determine the issuance of a licence. In determining the competence of non-Canadian residents, the Council may not consider the effect that the entry of non-Canadian licensees will have on the Canadian engineering employment market place.

III.4.5 Collaboration

There is, however, one provision in the Act which authorizes

the APEO to impose a condition that a licensee collaborate with Ontario professional engineers. Section 17(6) provides that:

The council may direct that any licence issued under subsection 2 shall, in addition to the conditions mentioned in subsection 5, contain a condition that the licensee may practise professional engineering in Ontario only in collaboration with a member who shall sign and seal any plans and specifications together with the licensee.

The Council of the APEO does not consider it proper to require a foreign licensee to collaborate with an Ontario consultant when the only basis upon which collaboration is sought to be justified is the advancement of the business interests of Ontario engineers. Recently, the APEO Council approved the following policy recommendation of its Professional Practice Board:

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That section 17(6) be invoked when (a) it is apparent that the Province of Ontario needs the new skill and expertise being offered by the prospective licensee and is clearly not currently available there; and (b) when the public interest and safety depend upon the application of procedure, laws, standards and customs, which would be supplied by the Ontario member engaged by the applicant. In all cases it should be clearly evident that clause 17(6) is not being invoked with the objective of financial gain for the Profession in Ontario.

A general discussion of some of the legal and policy considerations with respect to the collaboration issue may be found in "Guideline for Collaboration" - Section 17(6), a submission to the Committee on Admissions, G.W. Thompson, P.Eng., Director, Member Services Branch, and J.O. Harold, P.Eng., Registrar, April 18, 1972.

III.4.6 Grace Period

In some very narrow situations, a person who has applied for a licence may practice prior to its issuance. Section 17(4) provides that:

Where an applicant for a licence fails to obtain it promptly for any reason unrelated to his professional capacity or his own neglect, he may practise professional engineering in

Ontario for a period of not more than three months without a licence.

This provision was incorporated into the Act to remedy the situation created by the fact that Council generally meets every three months, and therefore is not able to approve the issuance of licences during that period.

III.4.7 Exemptions from the Licensing Provision

The Act provides for the exemption of two classes of government-employed engineers from the foreign licensing provisions. Section 18 provides that:

Any person who is employed as a professional engineer by a public service corporation carrying on an interprovincial undertaking or by the Government of Canada and who is by reason of his employment required to practise professional engineering in a province or territory of Canada other than that of his residence may practise professional engineering in Ontario without a licence, but he shall on demand of the council furnish satisfactory evidence that he is a member of an association of professional engineers in another province or territory of Canada that has objects similar to those of the Association.

A licence is not required of non-residents who perform engineering work outside of Ontario, for use in the Province, so long as they do not physically enter Ontario to perform any aspect of the engineering work.

III.4.8 Publication of Licences

As we have seen, at each of its meetings Council approves or refuses the issuance of temporary licences (usually upon the advice of the registrar). The results of its deliberations are contained in the Council minutes and are provided to the public in the APEO Ontario Digest section of the Engineering Digest.

III.4.9 Appeal from Council's Decision

Where an application for licence has been refused, the applicant

may appeal the Council's decision in the same manner as an applicant for membership [s.24(1)].

III.4.10 Discipline of Licensees

Licensees may be disciplined in exactly the same way as members of the Association. Section 9(1) makes it clear that the APEO Code of Ethics applies to licensees. Similarly, the same sanctions and disciplinary procedures are applicable to both licensees and members (s.25).

III.4.11 Licences with Respect to the Boilers and Pressure Vessels Act

The Boilers and Pressure Vessels Act,⁹¹ provides for the approval and registration of the design and specifications of boilers, pressure vessels, fittings and pipes to be fabricated for use in Ontario.⁹² The 1972 amendment to the Act now requires all such designs to bear the seal and signature of a professional engineer licensed to practise in Ontario.⁹³ Thus, in the case of a boiler designed and manufactured outside of the province, an engineer who is not resident in Ontario and who wishes to sign and seal the product design must obtain a licence pursuant to the provisions of section 20 of The Professional Engineers Act. The special problems which arise out of this procedure are detailed in "Licences Connected with the Boilers and Pressure Vessels Act of the Province of Ontario," C.A. Campbell, P.Eng., President and "Applications for Licences Under Section 17 of The Professional Engineers Act to comply with the provisions of The Boilers and Pressure Vessels Amendment Act, 1972," G.W. Thompson, P.Eng., Director, Member Services Branch, submissions made to the Council of the APEO.

III.4.12 Data

The following data represents an analysis of the number and kind

of licences issued by the APEO Council from January 1, 1967 to July 30, 1976.

Licence Statistics 1975

Total: 376

Canadian: 180

Non-Canadian: 196

Canadian Renewals: 94 New: 86

Non-Canadian Renewals: 109 New: 87

Boiler & Pressure Vessels Canadian: 27 Renewals: 7 New: 20

Boiler & Pressure Vessels Non-Canadian: 70 Renewals: 22 New: 48

1976 (Up to July 30/76)

Total: 355

Canadian: 162 Renewals: 103 New: 59

Non-Canadian: 193 Renewals: 138 New: 55

Boiler & Pressure Vessels Canadian: 27 New: 5 Renewals: 22

Boiler & Pressure Vessels Non-Canadian: 64 New: 11 Renewals: 53

TEMPORARY LICENCES ISSUED UNDER
SECTIONS 17(1) and 17(2) OF THE
ACT

			17(1)	17(2)	Total
January 1/67 to Dec. 31/67			62	32	94
"	68	68	80	38	118
"	69	69	108	39	147
"	70	70	140	77	217
"	71	71	154	81	235
"	72	72	158	125	283
"	73	73	131	176	307
"	74	74	222	111	333
"	75 to Dec.	75	180	196	376
"	76 to July	76	162	193	355

Temporary licences issued under Section 17(2) of the Act

YEAR	NEW	RENEWALS	B & P NEW	B & P RENEWALS	TOTAL
1967	16	16	-	-	32
1968	22	16	-	-	38
1969	16	23	-	-	39
1970	52	25	-	-	77
1971	29	52	-	-	81
1972	35	61	29	-	125
1973	33	66	33	44	176
1974	43	29	23	16	111
1975	86	94	48	22	196
1976	55	138	11	53	193

**ANALYSIS OF LICENCES ISSUED BY APEO
TO FOREIGN ENGINEERS 1971-1972**

Nature of Engineering Service	Purchaser	Per Cent of Total		
		Canadian Purchaser		Foreign Purchaser
		APEO Projects		APEO Projects
Consulting Engineer	Canadian Consulting Engineers	11		
	Canadian Architects	2		
	Developers, Government Agencies	26		
	US Consulting Engineers			2
Plant, Product and Process Design	Canadian Manufacturers	17		
	US Subsidiary Manufacturers and Parent Companies			20
	UK Subsidiary Manufacturers and Parent Companies			
Pressure Vessel Design	Ont. Dept. of Labour	10		
Building Services and Process Design	US Design Builders			10
Building Services	US Owners			2
TOTAL PER CENT		66		34

NOTE: The foregoing figures relate to
110 projects recorded by APEO

III.5 Specialty Designations

III.5.1 Designation as a Specialist

As we shall see below in Section IV, the academic training of engineers emphasizes training in one of the major disciplines of engineering: civil, mechanical, electrical, chemical, metallurgical, mining, geology, aeronautical and industrial. This educational differentiation reflects the fact that functional work roles of engineers are not homogeneous -- the services performed by a civil engineer trained in highway traffic are quite different from the services performed by a mining engineer. Perhaps because of this state of affairs the engineering profession has been amenable to the introduction of a system of specialty designation. It should be pointed out that there is no statutory prohibiting an engineer who received his degree in civil engineering from, for example, practising chemical engineering. There is, however, a provision in the APEO Code of Ethics that provides that "a professional engineer shall...undertake only such work as he is competent to perform by virtue of his training and experience, and shall, where advisable, retain and cooperate with other professional engineers or specialists."⁹⁴ The Code of Ethics, however, would not prevent a civil engineer from performing services relating to chemical engineering if he had gained expertise in some aspect of chemical engineering through experience after university.

The following excerpt from the Report of the Board of Specialization for the Period April 1973 to June 30, 1975, P.A. Lapp, Chairman, describes the history and purpose of the system of designation of specialists instituted by the APEO in 1973:

HISTORY

The origin of specialist designation within APEO is entwined with the development leading to the regulation of professional engineers in independent practice. The history can be traced back to 1952 when Dr. G.B. Langford, then Chairman of the Legislation Committee and consultant to the Ontario Securities Commission (OSC) brought a complaint before Council. It concerned the issuing of two reports on mining properties by two individuals calling themselves "consulting engineers". OSC took exception to the contents and asked that the authors be investigated. While both authors were registered, they had only one year of experience (it was not until 1962 that two years of experience were required for registration). As a result the Consulting Practice Committee established unofficially that a minimum requirement of five years engineering experience would be a prerequisite for a consulting engineer.

The first attempt to resolve the matter was in the revisions to the Professional Engineers Act, 1968/69 which provided for both the designation of specialists and of consulting engineers. The Act required that regulations covering specialists and consulting engineers be referred to the membership for majority ruling, and then be submitted to the Lieutenant Governor-in-Council for approval.

During the 1960's and early 1970's, interest grew within the profession. Outside pressures were also being exerted by such studies as the Ring of Iron; A Study of Engineering Education in Ontario; and groups such as The Wright Commission on Post-Secondary Education in Ontario; and the McRuer Commission on Human Rights. The APEC Control of Specialists Committee was formed in April 1971 and this led to a referendum on the designation of specialists and consultants late in 1972. In December, 1972, the membership approved regulations for both specialists and consulting engineers which became O. Reg. 59/73 and O. Reg. 60/73 respectively.

In April and July 1973, Council designated 44 members as chartered specialists and appointed them as the first Board of Specialization. The Board immediately established criteria for individuals who wished to qualify for specialist designation, and set up the related screening processes. It also prepared a constitution, procedures for processing applications, and the form and use of title by designated specialists. Nine Field Committees were appointed late in 1973 representing each of the fields of engineering listed in O. Reg. 59/73. They evaluate each application in detail and make recommendations to the Board.

The first specialists designated after the charter group were approved by Council in January, 1974. By June 1974, 92 applications had been received including the charter group; 48 were recommended for designation, 2 were not recommended and 42 were in process. The high percentage awaiting processing was caused in part by the large number of requests for classes that were not listed specifically in the regulations. Not wishing to abuse the discretionary power to add classes under the enabling clause in the regulations providing for "other engineering specialist classes", the Board appointed a special committee to develop a list of additional classes, and to propose guidelines for adding others in future.

The Board began operating under its new constitution in July, 1974, with eighteen members, comprising two from each of the nine fields of engineering. By June 27th, 1975 180 applications had been received, 145 recommended for designation, 21 not recommended and 14 in process. During the ensuing year, steps were initiated to prepare a Policy and Procedures Manual.

PURPOSE OF SPECIALIZATION

The three principal purposes of the program are:

- a) to allow the public to know and understand the engineer's special level of competence;
- b) to identify and recognize engineers who have achieved competence in a branch of engineering knowledge above that required for entrance into the Association, and
- c) to promote high standards of engineering practice and to encourage the continuing professional development of the individual engineer.

The regulations enacted with respect to the designation of specials are as follows:⁹⁵

DESIGNATION OF SPECIALISTS

O. REG 59/73

1. (I) Any applicant for specialist designation who,
 - (a) is a member;

- (b) is currently engaged in the practice of professional engineering or is teaching, at a level and at an institution that are satisfactory to the council, a course in any branch of engineering or science, the practice of which constitutes professional engineering and that is recognized by the council or is otherwise engaged at such an institution in an office or position satisfactory to the council, in the Province of Ontario;
- (c) has had five or more years of experience beyond membership requirements satisfactory to the council in the field of engineering in respect of which designation as a specialist is being sought; and
- (d) has passed the examinations prescribed by the council or has been exempted therefrom, pursuant to subsection (2),

shall be designated by the council as a specialist in that field of engineering.

- (2) The council may exempt an applicant from any of the examinations mentioned in clause (d) of subsection (1) if the council is of the opinion that the applicant has adequate experience, technical competence, academic qualifications and other qualifications.
 - (3) The council shall forthwith after reaching a decision mail to an applicant, postage prepaid, addressed to his last address appearing on the register, written notice that he has or has not been designated a specialist, as the case may be, as applied for and where a member has been designated a specialist, the council shall specify the title, term or designation by which such specialist may indicate his specialization in a field of engineering.
2. An application may be for specialist designation in one or more fields of engineering or for more than one specialist designation within any field of engineering.
3. The council may appoint a board of specialization to make recommendations to the council with respect to all matters relating to applications for specialist designation and for re-qualification for specialist designation, as provided for in section 5, and, without limiting the generality of the foregoing,
- (a) respecting the standards to be applied;
 - (b) respecting procedures for and the make-up of, examinations;
 - (c) respecting the qualifications of applicants; and
 - (d) respecting exemption of applicants from examinations.

4. An applicant shall appear personally before the council or, if a board of specialization has been appointed, the board of specialization, when so requested.
5. Designation as a specialist shall, unless earlier revoked pursuant to section 9, be valid for a period of five years, at which time application for re-qualification may be made.
6. Section 1 shall apply mutatis mutandis to any application for re-qualification as a specialist.
7.
 - (1) Any applicant whom the council has refused to designate as a specialist may, within thirty days from the date upon which he receives written notice of such refusal under subsection (3) of section 1, request the council to reconsider his application and upon receipt of such request the council shall reconsider the application taking into account such additional evidence, if any, as is submitted by the applicant.
 - (2) An applicant shall be deemed to have received such written notification on the second business day after it has been mailed to him, postage prepaid, addressed to his last address appearing on the register.
 - (3) Upon any hearing conducted under this section, the council may make findings of fact by such standards of proof as are commonly relied upon by reasonable and prudent men in the conduct of their own affairs.
 - (4) The council shall forthwith after reaching a decision on any application for reconsideration mail to the applicant, postage pre-paid, addressed to his last address appearing on the register, written notice either confirming the prior refusal of specialist designation or advising that such applicant has been designated a specialist, as the case may be, and, in the latter event, specifying the title, term or designation by which such applicant may indicate his specialization.
8. Only a member who has been designated as such by the council may take and use the term, title or designation denoting his qualification as a specialist in a field of engineering; use of any term, title or designation that will lead to the belief that he has been designated as a specialist by a member not so designated will constitute improper conduct in a professional respect under the definition of "professional misconduct" in the regulations.
9. Designation as a specialist may be revoked if the specialist has been found guilty of professional misconduct under section 25 of the Act.
10. The council may, from time to time, establish fees with respect to the designation of specialists.
11. The council shall cause to be published annually listings of members designated as specialists.

12. Where the council has notified an applicant under subsection (3) of section 1 or under subsection (4) of section 7 that he has not been designated a specialist as applied for, such applicant shall not be entitled to re-apply for such specialist designation for a period of 12 months from the date of such notification.
13. There shall be the following classes of specialists in the various fields of engineering:

Fields of Engineering

Classes of Specialists

Civil

Structures
Transportation
Environmental
Geotechnics
Hydraulics
Other civil engineering
specialist classes

Mechanical

Mechanics
Industrial
Production
Power
Heating and Air Conditioning
Other mechanical engineering
specialist classes

Aerospace

Structures
Aerodynamics
Propulsion
Other aerospace engineering
specialist classes

Electrical

Power
Electronics
Communications and Control
Other electrical engineering
specialist classes

Chemical

Processes
Production
Control
Other chemical engineering
specialist classes

Metallurgical

Mineral Processing and Extraction
Materials
Other metallurgical engineering
specialist classes

Mining

Methods and Systems
Processing
Other mining engineering
specialist classes

Geological

Exploration
Development
Other geological engineering
specialist classes

Agricultural and Biological

Food Production
Food Processing
Forestry
Other agricultural and
biological engineering
specialist classes

The following documents may also be referred to:

- Application for Designation as a Specialist contains information and guidelines for applicants and an application form
- Report of the Board of Specialization for the Period April 1973 to June 30, 1975 contains the Constitution of the Board of Specialization, rules prescribing the form and use of the title of designated specialists, a list of designated specialists and the definitions of the requirements for each classification of specialization
- Policy and Procedures Manual: Board of Specialization, April 1976

III.5.2 Designation as a Consultant

At the same time that the regulations dealing with the designation of specialists were introduced, the APEO introduced similar regulations creating a new designation of "Consulting Engineer":⁹⁶

1. (1) Any applicant for designation as a consulting engineer who,
 - (a) is a member;
 - (b) is currently engaged in the practice of professional engineering in the Province of Ontario;
 - (c) has had five or more years of experience in the practice of professional engineering, beyond membership requirements, satisfactory to the council; and
 - (d) has passed the examinations prescribed by the council or has been exempted therefrom, pursuant to subsection (2), shall be designated by the council as a consulting engineer.

(2) The Council may exempt an applicant from any of the examinations mentioned in clause (d) of subsection (1) if the council is of the opinion that the applicant has adequate experience, technical competence, academic qualifications and other qualifications.

(3) The Council shall forthwith after reaching a decision mail to an applicant, postage prepaid, addressed to his last address appearing on the register, written notice that he has or has not been designated as a consulting engineer, as the case may be, and where a member has been so designated he may take and use the title "Consulting Engineer" or any appropriate variation thereof approved by the council at such time or times as he is in independent practice.

(4) For the purposes of this regulation, a member shall be deemed to be in independent practice if,

(a) he offers professional engineering services generally to the public; or

(b) he is a member of a partnership or association of persons or an officer or director of a corporation and such partnership, association of persons or corporation offers professional engineering services generally to the public; or

(c) he is a full-time employee of a member mentioned in clause (a) or of a partnership, association of persons or corporation mentioned in clause (b).

2. The Council may appoint a board of regulation to make recommendations to the Council with respect to all matters relating to applications for designation as a consulting engineer and for re-qualification as such, as provided for in section 4, and, without limiting the generality of the foregoing,

(a) respecting the standards to be applied,

(b) respecting procedures for and the make-up of examinations;

(c) respecting the qualifications of applicants; and

(d) respecting exemption of applicants from examinations.

3. An applicant shall appear personally before the Council or, if a board of regulation has been appointed, the board of regulation, when so requested.

4. Designation as a consulting engineer shall, unless earlier revoked pursuant to section 8, be valid for a period of five years, at which time application for re-qualification may be made.

5. Section 1 shall apply mutatis mutandis to any application for re-qualification as a consulting engineer.

6. (1) Any applicant whom the council has refused to designate as a consulting engineer may, within thirty days from the date upon which he receives written notice of such refusal under subsection (3) of section 1, request the Council to reconsider his application and upon receipt of such request the Council shall reconsider the application taking into account such additional evidence, if any, as is submitted by the applicant.

(2) An applicant shall be deemed to have received such written notification on the second business day after it has been mailed to him, postage prepaid, addressed to his last address appearing on the register.

(3) Upon any hearing conducted under this section, the council may make findings of fact by such standards of proof as are commonly relied upon by reasonable and prudent men in the conduct of their own affairs.

(4) The Council shall forthwith after reaching a decision on any application for reconsideration mail to the applicant, postage prepaid, addressed to his last address appearing on the register, written notice either confirming the prior refusal of designation as a consulting engineer or advising that such applicant has been designated as a consulting engineer, as the case may be.

7. Only those persons who have been designated as such by the council may take and use the title "Consulting Engineer" or any appropriate variation thereof approved by the Council; use of such title or such variation by a member not so designated, by a partnership, association of persons or corporation at a time when it is not entitled to do so under section 10 or by a member who is so designated but at a time when he is not in independent practice will constitute improper conduct in a professional respect under the definition of "Professional misconduct" in the regulations.

8. Designation as a consulting engineer may be revoked if the consulting engineer has been found guilty of professional misconduct under section 25 of the Act.

9. The Council may, from time to time, establish fees with respect to the designation of consulting engineers.

10. A partnership, association of persons or corporation that holds a certificate of authorization may use the title "Consulting Engineers" or any appropriate variation thereof approved by the Council, where the practice of professional engineering is done under the responsibility and supervision of a designated consulting engineer who is in independent practice.

11. The right of a partnership, association of persons or corporation to use the title "Consulting Engineers" or any such variation thereof under section 10 may be revoked if the partnership, association of persons or corporation has been found guilty of conduct that would, in the case of a member or licensee, have been professional misconduct under section 25 of the Act.

12. The Council shall cause to be published annually a listing of members designated as consulting engineers and of partnerships, associations of persons and corporations entitled to use the title "Consulting Engineers" or any variation thereof.

13. A member may only make one application for designation as a consulting engineer in any twelve-month period.

14. This Regulation comes into force on the 1st day of January, 1974.

The APEO's Board of Regulation and the Council of the APEO have established guidelines with respect to the use of the title "Consulting Engineer" and criteria for the granting of the designation to an applicant. These may be found in a pamphlet entitled "Designation of Consulting Engineers," APEO, July 1975.

It should be noted that the regulations with respect to the designation of specialists and consultants do not prevent any registered engineer from practising one of the specialties or from engaging in the independent practice of engineering; the regulations merely certify that an engineer is a specialist or a consulting engineer and prohibit the use of the titles "specialist" and "consulting engineer" by persons not so designated.

III.6 Regualification of Practitioners

At present, except with respect to persons designated as specialists or as consulting engineers, there are no formal requirements for periodic requalification of professional engineers. (As we have already seen, an applicant for specialist or consultant designation may be required to pass examinations prescribed by the council. The designation is normally valid only for a period of five years, after which time the applicant may have to pass requalifying examinations.)

IV. THE UNIVERSITY TRAINING OF ENGINEERS

IV.1 Introduction

The most usual route taken by students wishing to practice engineering in Ontario is graduation from an accredited university programme in engineering. A relatively small number of persons qualify by taking the APEO examination programme. This section will not attempt to discuss comprehensively the history and present structure of engineering university education in this province. Rather it will outline broadly the location of accredited university programmes, admission requirements, enrolment figures, length of programmes, curriculum content and the relationship between the universities and the APEO.

The reader is referred to the following materials for a more detailed treatment of various aspects of university engineering education:

- C.R. Young, Early Engineering Education at Toronto, University of Toronto Press, Toronto, 1958 (A History of Engineering education up to 1920)
- R.S. Harris, Coldiron and Lady Godiva, University of Toronto Press, Toronto, 1973, (A history of engineering education at the University of Toronto from 1920-1973)
- D.J. Bell, A Short History of Engineering Science At the University of Toronto, University of Toronto Press, Toronto, 1970.
- P.A. Lapp, J.W. Hodgins, C.B. Mackay, Ring of Iron: A Study of Engineering Education in Ontario, A Report to the Committee of Presidents of Universities of Ontario, 1970 (A very comprehensive analysis of the most important aspects of engineering education, including research, faculty, relationship with the profession, relationship with industry, manpower requirements and the university system.)
- P.A. Lapp, Undergraduate Engineering Enrolment Projections for Ontario, 1970-80, Committee of Presidents of Universities of Ontario, CPUO Report No.70-1.

- Statement by the Council of Ontario Universities and Responses by Committee of Deans of Engineering, Ontario Council on Graduate Studies, Association of Professional Engineers of the Province of Ontario to "Ring of Iron: A study of Engineering Education in Ontario", Council of Ontario Universities, Report No. 71-13, 1971.
- J.M. Ham, P.A. Lapp, I.W. Thompson, Careers of Engineering Graduates 1920-1970, University of Toronto, The Engineering Alumni Association and the Faculty of Applied Science and Engineering, 1973.

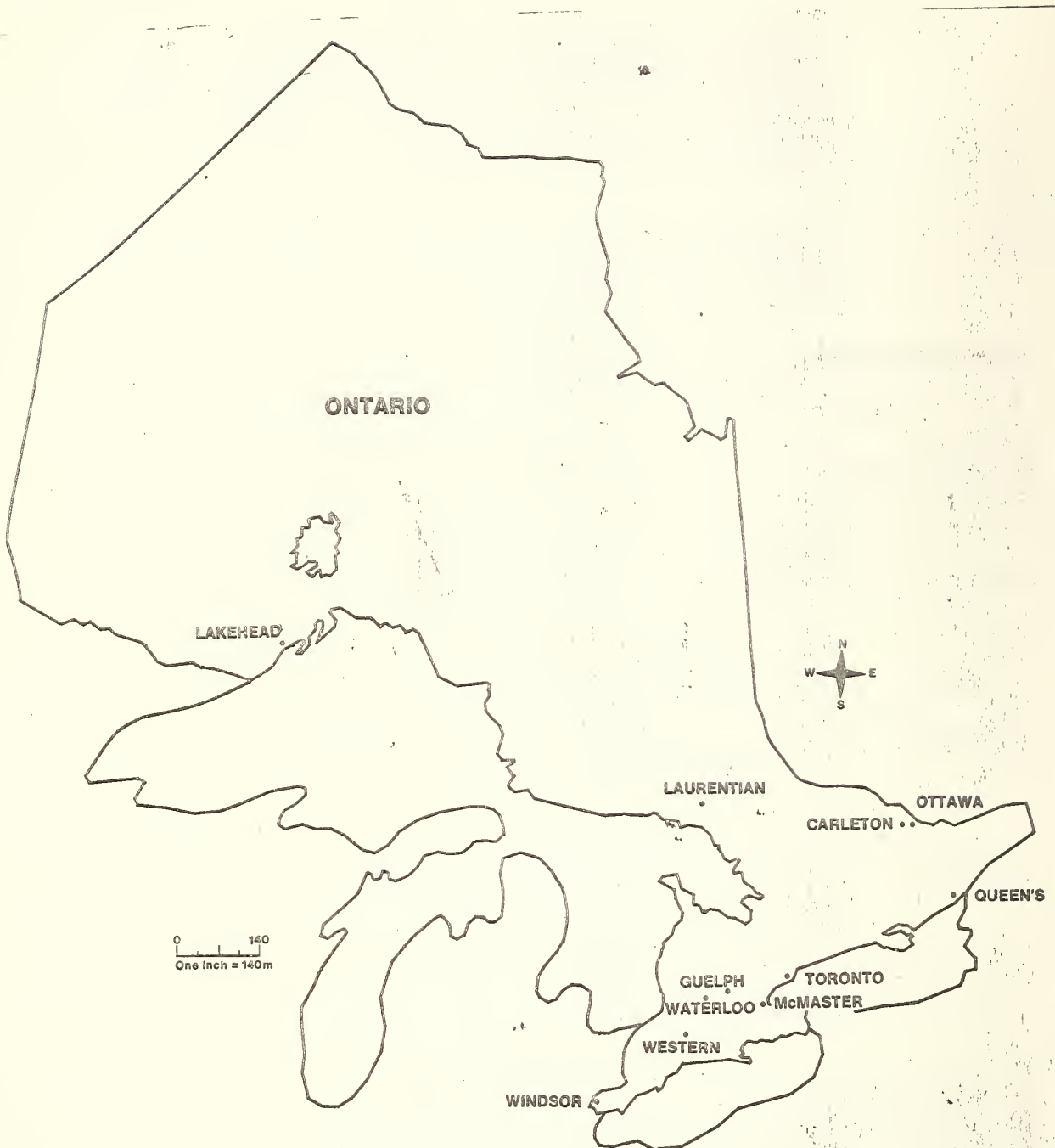
IV.2 Location of Accredited Programmes.

At present, there are accredited university programmes at the following eleven Ontario universities:

- Carleton University, Ottawa
- University of Guelph, Guelph
- Lakehead University, Thunder Bay
- Laurentian University, Sudbury
- McMaster University, Hamilton
- University of Ottawa, Ottawa
- Queen's University, Kingston
- University of Toronto, Toronto
- University of Waterloo, Waterloo
- University of Western Ontario, London
- University of Windsor, Windsor

Figure IV.5 details the geographic location of these universities:

FIGURE: Geographic Location of Ontario Engineering Schools⁹⁷



IV.3 Enrolment Data

The following table indicates full-time undergraduate engineering enrolments for all Ontario universities from 1941-1969:⁹⁸

TABLE: IV.3 FULL-TIME UNDERGRADUATE ENGINEERING
ENROLMENTS 1941 - 69, ONTARIO UNIVERSITIES

Academic Year	First-Year Engineering Enrolment	Total Engineering Enrolment	
1941-42	670	1,719	<u>Sources:</u> Data from 1941 to 1959, from Engineering Institute of Canada, <u>Engineering Journal</u> , generally reflect early Fall registrations.
1942-43	818	2,008	
1943-44	563	1,739	
1944-45	596	1,711	
1945-46	742	2,435	
1946-47	2,367	5,642	
1947-48	1,477	5,610	
1948-49	836	5,110	
1949-50	679	3,908	
1950-51	664	2,917	
1951-52	723	2,346	
1952-53	923	2,410	
1953-54	894	2,591	
1954-55	1,058	2,938	
1955-56	1,046	3,132	
1956-57	1,187	3,416	
1957-58	1,431	3,860	
1958-59	1,372	4,123	
1959-60	1,247	4,220	
1960-61	1,213	3,791	Data from 1960 to 1969, from submissions received from Ontario Universities, reflect engineering enrolments as of December 1 each year.
1961-62	1,284	3,823	
1962-63	1,470	3,922	
1963-64	1,706	4,401	
1964-65	1,870	4,894	
1965-66	2,233	5,685	
1966-67	2,581	6,415	
1967-68	2,735	7,218	
1968-69	2,789	8,002	
1969-70	2,676	8,502	

Table IV.4 breaks down aggregate Ontario enrolment by university:⁹⁹

TABLE IV.4: FULL-TIME UNDERGRADUATE ENGINEERING ENROLMENT AT ONTARIO UNIVERSITIES - BREAKDOWN BY UNIVERSITY

<u>University</u>	<u>Total</u> <u>1969-70</u>	<u>Total</u> <u>1974-75</u>	<u>Total</u> <u>1975-76</u>
Carleton	538	606	714
Guelph	157	163	194
Lakehead	47	258	322
Laurentian	37	57	60
McMaster	528	711	908
Ottawa	368	495	621
Queen's	1,160	1,346	1,469
Royal Military College	--	426	418
Toronto	2,199	2,450	2,450
Waterloo	2,349	2,785	2,859
Western Ontario	441	616	752
Windsor	402	334	478

The following extract from Engineering Manpower News, Number 7, January 1976 provides a short synopsis of engineering graduate and undergraduate enrolment patterns for Canada as a whole:

Graduates and undergraduates total 30,432, an increase of 3,475 over last year, or 12.9%. Last year, the increase was 1,867 or 7.4%.

I - UNDERGRADUATE

TOTAL - Undergraduate students number 25,238, an increase of 2,820 or 12.6% over last year. This increase more than doubled from what it was last year at 5.9%. Note that in 1972 and 1973, the decrease percentages had been 2.4% and 4.2%. This year's increase is due to the overall effects of seven (7) decreases and thirty (30) increases amongst the 37 Canadian schools of engineering. A distribution analysis by region of the 2,820 students indicates the following:

Atlantic Region - 8.2%
Central-Quebec - 24.5%
Central-Ontario - 35.4%
Western Region - 31.9%

The net average increase in students per university is twenty-three (23) for the Atlantic Region; eighty-six (86) for Central Quebec; eighty-three (83) for Central Ontario and one hundred and twenty-eight (128) for the Western Region. With respect to the increase of 2,280, two

hundred and thirty-two (232) students come from the Atlantic Region, six hundred and ninety-one (691) from Central Quebec, nine hundred and ninety-eight (998) from the Western Region.

GRADUATING - in 1975/76, the number of those graduating will be 4,025, a small increase of 28 or 0.7%. Last year that number had decreased by 134 to 3,997 or 3.2%. The preceding year, the decrease had been 3.0%. The number of graduating students continues to rise but still is less than that of the 1972/73 level. Over the last four consecutive years, the average number of engineering graduates is 4,102. Each region added approximately 25 graduates, except for the loss of 40 in the Atlantic Region.

NEW STUDENTS - There are 8,841 new students, an increase of 1,143 or 14.9%. This makes up for 40.5% of the undergraduate total increase. In view of the various durations of engineering programmes in Canada, second year figures lose much of their significance and have not been computed. The distribution by region of the 14.9% increase is 12% for the Atlantic Region, 23.5% for Central Quebec, 7.7% for Central Ontario and 46.8% for the Western Region. Figures indicate that the proportion of new students is dropping in the Central Provinces and rising in the others.

DISCIPLINES - Chemical, geological, industrial and mining engineering are part of the eight (8) decreases, and civil, electrical, management and mechanical engineering belong to the nine (9) increases. For undergraduate figures, preparatory level and part-time students have not been included (wherever possible).

II - GRADUATE

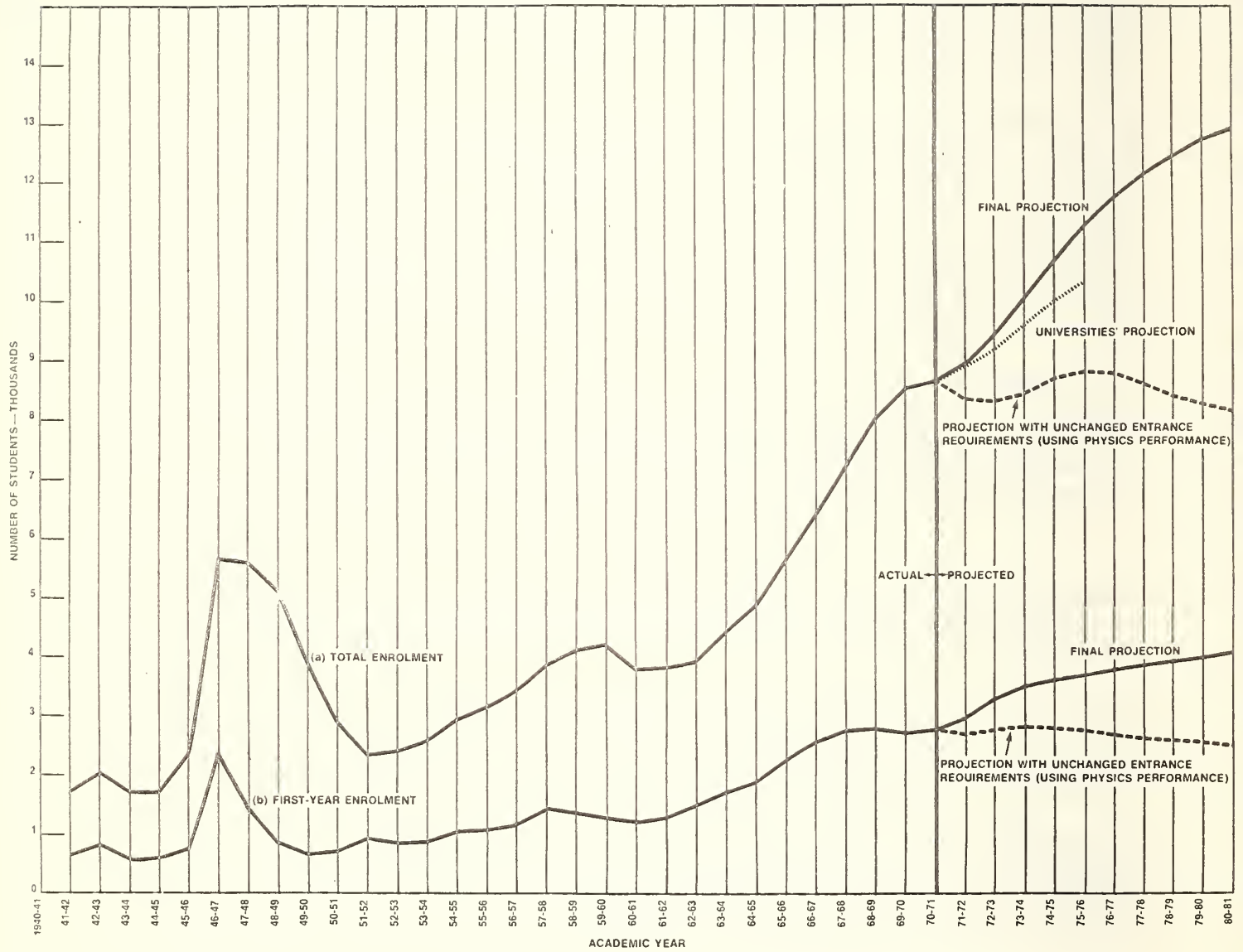
GRADUATE REGISTRATION - The registration of graduate students stands at 5,194, an increase of 655 or 14.4%. The increase last year had been 625 students or 16.0%.

On a discipline basis we find very significant increases in nuclear and systems design engineering; we also find significant increases in engineering and management, electrical, civil and mechanical engineering. The only drop is in engineering physics.

A regional analysis of the 655 increase shows Central Ontario ahead with 407 students total and an average of 41 students per university, followed by Central Quebec with 142 students and 24 per university, the Western Region with 96 and 16 and finally, the Atlantic Region with 10 and 3.

Finally, Figure IV.6 graphically illustrates actual and projected engineering undergraduate enrolment in Ontario
100
universities from 1941-80:

FIGURE IV.6



It should be noted that neither the APEO nor the Ministry of Colleges and Universities have any direct input with respect to the number of students accepted into the university system. The universities are completely autonomous in this regard.

IV.4 Admission Requirements

IV.4.1 In General

The admission requirements of each Ontario university may differ in some respects. Each university is completely autonomous in the setting of its admission standards. No control whatsoever is exerted either by the APEO or the Ministry of Colleges and Universities. The following list of admission requirements generally obtain to most university engineering programmes:

1. Graduation from Grade XIII with an average of not less than 60% (sometimes 65%) in the following subjects:
 - (a) Mathematics - usually two or three courses including Functions and Relations, Algebra and Calculus.
 - (b) Physics
 - (c) Chemistry
 - (d) Additional subjects to complete Secondary School Honour Graduation Diploma.
2. Some universities will admit grade 12 graduates who have completed a "Qualifying University Year" or "Pre-University Year."
3. Graduates of College of Applied Arts and Technology and the Ryerson Polytechnical Institute may be admitted into some university programmes in engineering. In the usual case, only students who have completed two or three years of an engineering technology diploma will

be considered for admission into the first year of the university degree programme. In some cases, holders of three-year diplomas in engineering technology may be admitted into the second year of the university degree programme.

IV.4.2 Minority Admission and Geographical Standards

No Ontario university at present prescribes any form of minority admission or geographical standards.

IV.4.3 Foreign Student Quotas

Some engineering faculties have set limits on the number of foreign students (i.e. non-landed immigrants) admitted. For example, the Faculty of Applied Science and Engineering at the University of Toronto has set an arbitrary limit of five per cent on the number of foreign students admitted to its undergraduate programme. Again, it ought to be emphasized that neither the APEO nor the Ministry of Colleges and Universities play any direct role in the setting of foreign student quotas. However, recent increases in the tuition fees of foreign students implemented by the Ministry of Colleges and Universities may have the indirect effect of limiting the number of foreign students applying for admission to Ontario universities.

IV.5 Length of Programmes and Curriculum Content

The various universities offer several alternatives to choose from with respect to programme length and curriculum content. Six patterns have emerged:

1. Four years, first year common-core curriculum, second to fourth year specialization within one of the engineering disciplines (mechanical, civil, electrical, etc.) - most common pattern; offered at the University of Toronto.

2. Four years, first and second year common-core curriculum, third and fourth year specialization within one of the engineering disciplines - offered at the University of Western Ontario.

3. Four years, first to third year common-core curriculum, fourth year specialization - offered at Carleton University.

4. Five years, co-operative programme consisting of alternate terms of academic and practical training including eight terms study at university and six terms placement in an industrial setting - offered at the University of Waterloo.

5. Two years, no degree - offered at Laurentian University; students must complete final two years at another institution.

6. Two years and a summer, open to holders of three year diploma in engineering technology from Community College or Ryerson, summer term of enrichment in engineering fundamentals, first and second year common-core curriculum with options available for specialization in limited number of engineering disciplines - offered at Lakehead University.

The following table illustrates the wide variety of engineering programmes available at each Ontario university in 1970:¹⁰¹

TABLE IV.5: UNDERGRADUATE ENGINEERING
PROGRAMMES AVAILABLE IN ONTARIO

PROGRAM	CARLETON	GUELPH	LAKE- HEAD	LAUR- ENTIAN	McMASTER	OTTAWA	QUEEN'S	TORONTO	WATERLOO	WESTERN	WINDSOR
Chemical				X	X	X	X ^b	X	X	X	X
Civil	X		X ^a	X	X	X	X	X	X	X	X
Electrical	X		X ^a		X	X	X	X	X	X	X
Mechanical	X		X ^a		X	X	X	X	X	X	X
Metallurgy and Materials					X		X	X		X	X
Industrial								X			X
Geology				X				X			X
Mining							X				
Engineering											
Physics or Science					X		X ^c	X			
Agriculture		X									
Engineering and Management					X ^a						
Systems Design									X		

^a Offered for the first time in 1970-71.

^b Including Chemistry (Engineering).

^c Including Mathematics and Engineering.

Reference should be made to the Ring of Iron¹⁰² which provides an excellent overview of the history of engineering education at each of the Ontario universities, a description of the types of programmes offered at each, and recommendations respecting the future development of each programme. Reference may also be made to the calendars from each of the universities in Ontario offering programmes in engineering.

IV.6 Continuing Education

Several types of continuing education programmes are available at Ontario universities:

1. Part-time graduate work
2. Courses for exemption from the examinations of the APEO.

While these courses may not be used towards receiving university credit,

they do satisfy the course requirements of the APEO examination system. Any person may take such courses - there are no educational prerequisites. The courses offered at the University of Toronto are outlined in a brochure entitled "Evening Courses in Civil, Chemical, Mechanical and Electrical Engineering, Fall 1976." The University of Toronto first offered two courses of this programme in the Fall of 1974 in which 24 students enrolled; in the Fall of 1975 a total of 535 students enrolled in ten courses; this year, more than 1,000 students will enrol in 14 courses. Professor I.G. Currie, the director of the continuing education programme, states that there is an attrition rate of about 33%. He also estimates that approximately 85% of the students taking the courses are doing so in order to satisfy APEO examination requirements, while the remaining 15% are doing so for reasons other than APEO credit. The large majority of the latter group consists of registered professional engineers wishing to upgrade their education because of a change in employment or for other reasons.

3. Special seminars. From time to time the universities offer seminars and courses on specialized topics for the benefit of engineers and other interested persons.

IV. 7 Relationship Between the Educational Institutions and the APEO

The APEO has been very active in establishing close formal and informal relations with the Ontario universities offering engineering programmes:

1. The most direct contact between the regulatory body and the universities is in the accreditation of university curricula to satisfy the licensing requirements of the APEO. The functioning of the Canadian Accreditation Board and the participation of the APEO

in all of its activities have been discussed in a previous section of this paper.¹⁰³

2. As we have seen, the APEO has been cooperating increasingly with the universities with a view to transferring the responsibility for the administration of the APEO examination programme to the universities.

3. The APEO has created the Ontario Professional Engineers Foundation for Education, the objects of which are, inter alia:

To promote the training and education of professional engineers, and to do all such things as are incidental or conducive to the foregoing objects, and in particular:

- i. To use, apply, give, grant or distribute from time to time all or any part of the property of the Corporation and/or the income therefrom for educational purposes and to educational institutions, including universities, colleges, or schools, in Ontario or elsewhere in Canada;
- ii. To provide for scholarships to persons attending or proposing to attend any school, college or university or undertaking or proposing to undertake post-graduate study or research in Ontario or elsewhere in Canada;
- iii. To provide for bursaries or financial assistance, including loans or gifts to persons attending or proposing to attend any school, college or university or undertaking or proposing to undertake post-graduate study or research in Ontario or elsewhere in Canada;
- iv. To assist, by way of gifts, grants, loans or otherwise, through other charitable institutions, teachers and persons proposing to become teachers in Ontario or elsewhere in Canada; and
- v. To co-operate with other organizations whether incorporated or not which have objects similar in whole or in part to the objects of the Corporation; provided that no members of the Corporation shall receive any such grants, scholarships, bursaries or assistance.

The membership and activities of the foundation are detailed in the foundation's Report to the Board of Directors for the Year 1975.

The major portion of the Foundation's expenditures is directed towards

the financing of various university scholarships.

4. The Professional Development Committee of the APEO liaises with the universities on a regular basis. One of the Committee's terms of reference is to "coordinate the activities of the Association in all areas of continuing education, providing liaison with engineering schools, with a view to improvement of facilities for continuing education." 104

5. Most faculty members of the engineering schools are members of the APEO.

6. The present Acting Executive Director of the APEO, Mr. L.C. Sentance, is Honorary Secretary of the Committee of Deans of Engineering. The APEO also has a representative who attends all meetings of CODE.

7. The APEO is involved in public relations activities on university campuses. In addition to other activities, it distributes pamphlets describing the profession of engineering and the role of the APEO, and often will provide speakers to lecture on professional responsibility and ethics.

8. Finally, the APEO has been very active in promoting its views with respect to engineering education in briefs submitted to the Commission on Post-Secondary Education and in a paper reacting to the Ring of Iron.

For a more thorough understanding of the APEO's position on engineering education the reader is referred to the briefs listed on page 58 of this paper.

V. PRACTICE OF THE PROFESSION AND ITS RELATIONSHIP TO THE REGULATORY STRUCTURE

V.1 Work and Function of the Professional Engineer

A most important characteristic of the practice of engineering is that there are institutionally recognized fields of practice. These fields of practice are in effect specialties inherent in the nature of the profession; they are not specialties the practice of which depends upon a specialty licence. As we have seen, a registered member of the APEO does not require a licence to practice civil, electrical or mechanical engineering; the APEO specialty designation requirements only prevent an engineer who has not received such designation from holding himself out as a specialist in a given discipline. The following short extract from "A Career in Engineering" describes the various engineering disciplines:¹⁰⁵

MAJOR FIELDS OF ENGINEERING

CIVIL ENGINEERING

The first engineers were irrigators, artists and military engineers, and gradually as practitioners became involved in engineering works of a non-military nature, the field of 'civil' engineering evolved.

Broadly speaking, civil engineers design and supervise the construction of roads, highways, bridges, airports, railways, harbours, buildings, tunnels, hydro-electric plants, water supply and sewage systems. In fact, many specialize in one phase of civil engineering, such as highway, sanitary, soil or hydraulic engineering.

Young, inexperienced engineers do relatively elementary work in design, computer programming and construction control, but have the opportunity to progress to more responsible and challenging work.

Many civil engineers have direct contact with clients and the public. Often they are members of interdisciplinary teams on large projects requiring knowledge, ability and a variety of skills. Whether operating as an individual or on a project team, leadership is required, and opportunities exist to assume control, and exercise supervisory and managerial responsibility.

Today's new techniques involving pre-stress concrete, high tensile steels and newly-developed materials, have opened up exciting possibilities in the field.

The burgeoning growth of urban and regional areas require civil engineers for the development of these areas, including transit and transportation systems, and the various environmental controls to meet standards of air and water purity, and noise levels.

Civil engineering graduates may find employment in large industrial organizations, federal, provincial and municipal governments, educational institutions, the construction industry, consulting engineering, the logging and wood products industry, and the iron and steel industry.

ELECTRICAL ENGINEERING

Electrical engineers are involved in the design and construction of systems which generate, transmit, control and utilize electrical energy, and the development and manufacture of a wide variety of electrical devices.

Those engineers specializing in the power field are concerned with the design and development of heavy equipment such as generators, power transmission and distributing systems used by utilities, control systems, and other electrical applications used by industry, commerce and the public.

Engineers in the field of communications are involved with the development, manufacture and maintenance of systems capable of transmitting data over long distances. Advanced systems and techniques, such as solid state switching and microwave relays utilizing satellites, have increased and improved the services offered by telephone and telecommunications facilities.

Electrical engineers may find employment with manufacturers of electrical and electronics equipment, including the automation and control of complex electrical systems, computers, and data processing.

They may also be concerned with the maintenance of large industrial organizations, or employed by various government agencies.

The electrical engineer may fill positions in design, development, research, operations, and management in any of these fields.

MECHANICAL ENGINEERING

Mechanical engineers are concerned with the design, development, manufacture, sale, operation and maintenance of machinery or mechanical devices that produce, transmit, or consume power, or employ heat energy. Such devices range from household plumbing to pneumatic actuator systems in aircraft, and from household appliances to gyro stabilizers.

Several specialized areas of employment are available to graduates of mechanical engineering, and include machine design, heating, ventilation and air conditioning, refrigeration, power plants, development of water control works, automotive industry and thermal and nuclear power and process plants.

Others may be engaged in the field of power generation dealing with steam, diesel or other internal combustion engines; hydraulic or gas turbines; power transmission; locomotives, marine vessels; boilers, pressure vessels and heat exchangers; motors and generators; machine tools.

Mechanical engineers are employed in such industries as mining, transportation, oil refining, communications, paper, sugar, textiles, construction and chemical manufacture; and all levels of government and educational institutions.

Generally, mechanical engineers prepare specifications and cost estimates for machinery, equipment or plants. They direct feasibility studies and the testing of pilot plants or prototypes, evaluating and recommending modifications or improvements. They also work at quality control, production scheduling, and the development of more efficient methods and techniques.

New graduates are assigned routine duties under close supervision and as they gain experience and demonstrate their ability to assume greater responsibility, the degree of supervision is relaxed. Recognition of engineering ability and leadership qualities often leads to senior engineering and management positions.

INDUSTRIAL ENGINEERING

Industrial engineers are concerned with the design, improvement, and installation of integrated systems of men, materials and equipment. The techniques of industrial engineering embody specialized knowledge and skill in mathematics, the physical and social sciences, the use of computer systems, together with the principles and methods of engineering analysis and design, to specify, predict and evaluate the results to be obtained from those systems.

ELECTRICAL ENGINEERING

Electrical engineers are involved in the design and construction of systems which generate, transmit, control and utilize electrical energy, and the development and manufacture of a wide variety of electrical devices.

Those engineers specializing in the power field are concerned with the design and development of heavy equipment such as generators, power transmission and distributing systems used by utilities, control systems, and other electrical applications used by industry, commerce and the public.

Engineers in the field of communications are involved with the development, manufacture and maintenance of systems capable of transmitting data over long distances. Advanced systems and techniques, such as solid state switching and microwave relays utilizing satellites, have increased and improved the services offered by telephone and telecommunications facilities.

Electrical engineers may find employment with manufacturers of electrical and electronics equipment, including the automation and control of complex electrical systems, computers, and data processing.

They may also be concerned with the maintenance of large industrial organizations, or employed by various government agencies.

The electrical engineer may fill positions in design, development, research, operations, and management in any of these fields.

MECHANICAL ENGINEERING

Mechanical engineers are concerned with the design, development, manufacture, sale, operation and maintenance of machinery or mechanical devices that produce, transmit, or consume power, or employ heat energy. Such devices range from household plumbing to pneumatic actuator systems in aircraft, and from household appliances to gyro stabilizers.

Several specialized areas of employment are available to graduates of mechanical engineering, and include machine design, heating, ventilation and air conditioning, refrigeration, power plants, development of water control works, automotive industry and thermal and nuclear power and process plants.

Others may be engaged in the field of power generation dealing with steam, diesel or other internal combustion engines; hydraulic or gas turbines; power transmission; locomotives, marine vessels; boilers, pressure vessels and heat exchangers; motors and generators; machine tools.

Mechanical engineers are employed in such industries as mining, transportation, oil refining, communications, paper, sugar, textiles, construction and chemical manufacture; and all levels of government and educational institutions.

Generally, mechanical engineers prepare specifications and cost estimates for machinery, equipment or plants. They direct feasibility studies and the testing of pilot plants or prototypes, evaluating and recommending modifications or improvements. They also work at quality control, production scheduling, and the development of more efficient methods and techniques.

New graduates are assigned routine duties under close supervision and as they gain experience and demonstrate their ability to assume greater responsibility, the degree of supervision is relaxed. Recognition of engineering ability and leadership qualities often leads to senior engineering and management positions.

INDUSTRIAL ENGINEERING

Industrial engineers are concerned with the design, improvement, and installation of integrated systems of men, materials and equipment. The techniques of industrial engineering embody specialized knowledge and skill in mathematics, the physical and social sciences, the use of computer systems, together with the principles and methods of engineering analysis and design, to specify, predict and evaluate the results to be obtained from those systems.

Industrial engineering involves methods engineering, time and motion study, plant layout, facilities and material planning, production and quality control, training programs, value analysis, accident prevention, and wage incentive planning.

The industrial engineer, then, is involved with the application of engineering principles to produce large quantity units in an efficient and economical manner.

Employment may be found in service industries of all kinds, basic and manufacturing industries, warehouses, wholesalers and retail stores, transportation services, offices, public services, and public utilities.

Opportunities for advancement to management and executive positions are available to those who have demonstrated the necessary attributes.

CHEMICAL ENGINEERING

Chemical engineers are involved with the research, construction and operation of equipment and processes related to the development and manufacture of various chemicals and chemical products.

From the development of new processes or products at the laboratory stage, the chemical engineer is responsible for translating them to production proportions, in which large quantities of materials are moved by conveyor or pipeline, and processed in large vessels equipped with automatic controls. Continuous processing is regulated more and more by computers, at the laboratory level as well as production.

Chemical engineers may be involved in hydro-metallurgical extraction, or in the manufacture of natural rubber, pulp and paper, fertilizers, soaps and detergents, salts, resins, pharmaceuticals, petroleum products, paints and varnishes, protective coatings, plastics and synthetics.

Other fields are in environmental pollution control, biomedical engineering and space technology.

Newly graduated chemical engineers are normally employed in junior positions, assigned to work with more experienced engineers. With necessary ability, they can expect to move up to greater responsibility in design, operations, marketing, consulting or management.

MINING ENGINEERING

Mining engineers are involved in planning, organizing and managing the complex operations of a mining enterprise. Their work entails the development of new methods of drilling, the general improvement of the mining environment, and the sociology of mining. Not only are their skills applied to conventional methods of mining ore deposits, but also to unconventional methods in the exploitation of marine mineral resources and design of tunnels, underground power houses, and dam foundations.

Mining engineers are employed by the mineral industry, and also by government in the areas of applied research and in the analysis of technological and economic problems in the mining industry.

They may also be involved in the choice, design and application of mining equipment. They may enter manufacturing, or fill positions in other engineering fields such as highway design or petroleum engineering.

OTHER FIELDS OF ENGINEERING

Geological Engineering

The study of rocks and soil of an area to determine its surface and sub-surface structure, and the application of the results to the exploration and development of mineral deposits, and the planning and construction of dams, buildings, highways, etc.

Metallurgical Engineering

The application of engineering principles to the recovery of metals from ores, and the conversion of metals and minerals into useful products.

Petroleum Engineering

The study of the earth's crust in relation to its deposits of oil and gas, and their recovery for commercial purposes.

Engineering Physics

The application of the principles of physics and chemistry to design machinery and processes.

Aerospace Engineering

The art and science of designing, developing, manufacturing and operating airborne and space vehicles, and their associated ground systems.

Biomedical Engineering

The use of engineering knowledge to improve the well-being of man, and the construction of instruments, artificial organs and systems for medical practice and biological research.

Agricultural Engineering

The application of the principles of agricultural science and engineering to develop equipment and methods for improving efficiency in the production, processing and distribution of agriculture products.

RELATED OCCUPATIONS

At the professional level, certain occupations rather closely related to engineering are available, one of which might be preferred by the prospective engineering student. Some of these are: architect, chemist, bacteriologist, biologist, contractor, forester, geologist, mineralogist, physicist, surveyor.

Some of the occupations related to engineering but not requiring university or full professional training are: assayers, chemical plant operators, communications technicians, draughtsmen, estimators, foremen, inspectors, instrument technicians, laboratory technicians, metallographers, power station operators, photographers, production control men, radio technicians, samplers, shift bosses, surveymen, superintendents, technical clerks, timber cruisers, water or sewage plant operators, X-ray technicians.

It should be noted that the primary factor that was responsible for the development of different engineering disciplines was the development of new and more advanced forms of technology. It is stating the obvious to say that future advances in technology will bring concomitant changes in the types of engineering disciplines.

Another important characteristic of the practice of engineering

in Ontario is that a very definite trichotomy exists between the three different occupational areas of engineering practice. The great majority of professional engineers practice professional engineering as employees of industrial and governmental concerns that have in-house engineering departments or as employees of consulting firms; fewer engineers are in the independent practice of engineering as consultants; finally, some persons registered as professional engineers do not in fact practice professional engineering but rather work in engineering-related areas of industry. The 1968 Membership Survey of the APEO generated the following data with respect to the fields of employment of its members:¹⁰⁶

Field and Level of Employment

Manufacturing (27.9%) was by far the largest single field in which the respondents were employed (Q14). The earnings of respondents tended to be highest in Mining, Consulting, Distribution and Construction and lowest in Agriculture, Forestry and Fishing, Provincial Government (excluding Utilities), Education (excluding University) and the Armed Forces (Q6-14). Respondents in Mining, Consulting, Distribution, Construction and Data Processing tended to feel the least underpaid for the work they did and those in Local Government, the Utilities and the Chemical industry tended to feel most underpaid (Q14-40). The respondents in the Utilities and other Provincial Government generally favoured collective bargaining. Those in Communications, Education (other than the Armed Forces) and Local Government were less opposed to it than the remainder

of respondents and those in Mining, Consulting, Distribution and Data Processing were most opposed to bargaining (Q14-58).

Only 7.7% of respondents regarded themselves as owners as opposed to managers (36.2%) or employees (56.2%) (Q33). The gross earnings of the respondents who considered themselves to be owners were the highest and were followed in order by managers and employees (Q6-33). The owners were most opposed to collective bargaining and the managers more opposed to it than the employees (Q33-58).

19.1% of respondents stated that their work was mainly non-supervisory (Q15) and 23.5% indicated that in their jobs they did not have authority to make decisions involving personnel, policy or expenditures (Q37). Respondents who were older (Q1-37) and who were owners and managers (Q33-37) had more authority to make such decisions. The gross earnings of respondents increased significantly with their level - non-supervisory, supervisory, administrative and executive (Q6-15) and the higher the level of the respondents' work the less they wanted collective bargaining for professional engineers (Q15-58). The largest proportion of respondents who reported that their work was mainly executive-administrative were employed in Mining, Construction, Transport, the Armed Forces, Local Government and Distribution. The largest proportion of respondents in non-supervisory positions were in Agriculture, Forestry and Fishing, Manufacturing, the Chemical industry, Communications, the Utilities and other Provincial Government, the Federal Government (excluding the Armed Forces) and Data Processing (Q14-15).

V.2 Statutory Definition of the Practice of Engineering and
Mandatory Duties Imposed by Statute

For the purposes of regulating the practice of engineering in Ontario, The Professional Engineers Act defines the "practice of professional engineering" in the following manner:¹⁰⁷

"practice of professional engineering" means the doing of one or more acts of advising on, reporting on, designing of or supervising of the construction of, all public utilities, industrial works, railways, tramways, bridges, tunnels, highways, roads, canals, harbour works, lighthouses, river improvements, wet docks, dry docks, floating docks, dredges, cranes, drainage works, irrigation works, waterworks, water purification plants, sewerage works, sewage disposal works, incinerators, hydraulic works, power transmission systems, steel, concrete or reinforced concrete structures, electric lighting systems, electric power plants, electric machinery, electric or electronic apparatus, electrical or electronic communication systems or equipment,, mineral property, mining machinery, mining development, mining operations, gas or oil developments, smelters, refineries, metallurgical machinery, or equipment or apparatus for carrying out such operations, machinery, boilers or their auxiliaries, steam engines, hydraulic turbines, pumps internal combustion engines or other mechanical structures, chemical or metallurgical machinery, apparatus or processes, or aircraft, and generally all other engineering works including the engineering works and installations relating to airports, airfields or landing strips or relating to town and community planning;

This definition of the practice of professional engineering is of very great importance, insofar as any person who engages in the practice of professional engineering who is not a member or licensee of the APEO or is not specifically exempted from the operation of the statute pursuant to section 2 may be found guilty of an offence. ¹⁰⁸ As we shall see, the jurisdictional dispute between architects and engineers depends on the extent to which this definition of the practice of professional engineering -- which includes "the... designing of or supervising of the construction of... steel, concrete or reinforced concrete structures..." -- permits engineers to design "buildings."

The course of the jurisdictional dispute between the engineering profession and engineering paraprofessionals is also closely connected to the statutory definition of professional engineering. Unlike architects, engineering technicians and technologists who at present practise professional engineering incidental to their work as technicians and technologists are not protected from prosecution. The question that must be decided is the extent to which technologists and technicians may perform the acts enumerated in the section 1(i) definition without the supervision of a registered professional engineer, for section 19(3) provides that "[a]ll final drawings, specifications, plans, reports and other documents involving the practice of professional engineering when issued shall bear the signature and seal of the professional engineer who prepared or approved them."

V.3 Scope of Practice: Herein of the "Practice of Professional Engineering"

Having outlined the statutory definition of the practice of engineering we shall now examine the practical consequences of such a definition. Subsections V.3.1 and V.3.2 will detail briefly the

general statutory provisions that obtain with respect to the enforcement of the Act. Subsections V.3.3 and V.3.4 will examine at some length the jurisdictional problems between architects and engineers and between engineering technologists and professional engineers respectively as a result of the practical application of the statutory definition.

V.3.1 Enforcement of the Act

The licensing power of the APEO is reinforced by the provisions of The Professional Engineers Act which create a quasi-criminal offence for breach of the Act:

27.—(1) Every person, other than a member or a licensee, who,

- (a) takes and uses orally or otherwise the title "Professional Engineer" or "Registered Professional Engineer" or uses any addition to or abbreviation of either such titles, or any word, name or designation that will lead to the belief that he is a professional engineer, a member or a licensee or, except as permitted by section 2, uses the title or designation "engineer" in such a manner as will lead to the belief that he is a professional engineer, a member or a licensee;
- (b) advertises, holds himself out, or conducts himself in any way or by any means as a member or a licensee; or
- (c) engages in the practice of professional engineering,

is guilty of an offence.

(2) Every person who,

- (a) wilfully procures or attempts to procure registration under this Act for himself or for another person by making, producing or causing to be made or produced any fraudulent representation or declaration either verbal or written; or
- (b) knowingly makes any false statement in any application or declaration signed or filed by him under this Act,

is guilty of an offence.

(3) Where a partnership, association of persons or corporation that has no subsisting certificate of authorization,

- (a) practices professional engineering;
- (b) uses orally or otherwise any name, title, description or designation that will lead to the belief that it is entitled to practice professional engineering; or
- (c) advertises, holds itself out or conducts itself in any way or in such manner as to lead to the belief that it is entitled to practise professional engineering,

every member of the partnership, every member of the association or persons, or the corporation and every director thereof, is guilty of an offence.

(4) Where a partnership, association of persons or corporation that has a subsisting certificate of authorization practises professional engineering in contravention of this Act, every member of the partnership, every member of the association of persons, or the corporation and every director thereof, is guilty of an offence.

(5) Every person, member of a partnership, member of an association of persons, and every corporation and director thereof, who is guilty of an offence under this section is on summary conviction liable to a fine of not more than \$1,000 or to imprisonment for a term of not more than six months, or to both.

(6) No proceedings shall be commenced for a contravention of any of the provisions of this section after two years from the date of the commission of such contravention. 1968-69, c. 99, s. 27.

It is the responsibility of the APEO to ensure that the Act is enforced. The APEO has no formal mechanism for detecting breaches of the Act. The administrative officer primarily charged with the responsibility of handling all matters arising out of the enforcement of the Act is the Director of Professional Practice. To a large extent, the Director of Professional Practice depends upon the members of the APEO to inform him of any breaches that may be occurred. Upon receiving a complaint, he then conducts an informal investigation to ascertain whether a breach has in fact occurred. In most cases, the offender will be informed that he is in breach of the Act and that unless the practice ceases immediately formal action will be undertaken. The great majority of cases are resolved informally either by the staff of the APEO or by the Association's solicitors outside of court; very few cases have actually resulted in formal court proceedings. The following memorandum with respect to the activities of the APEO enforcement staff during the last two and one-half years was forwarded to this project by the Director of Professional Practice of the APEO:

Cases resolved by staff:	40
Cases settled by our lawyers out of court:	60
Cases settled in the courts:	<u>6</u>

Total major cases since April 1974:	106
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Currently staff has 31 active cases, 21 of which have been referred to our lawyers for further action.

Not appearing in any enforcement statistics over the years are the multitude of minor infractions by non-members, GEIT's (i.e. student members) and by corporations, partnerships and associations of persons. These contraventions of The Professional Engineers Act are usually inadvertent and a consequence of ignorance of the provisions mentioned above. These are readily handled through the use of form letters, and have averaged out at about 15/month and are almost invariably resolved with a single exchange of correspondence.

V.3.2 Statutory Exemptions

The Professional Engineers Act provides protection to several groups of persons who might otherwise be subject to prosecution for practising professional engineering as defined by the statute:

2. Nothing in this Act prevents,

- (a) any person from performing his duties in the Canadian Armed Forces;
- (b) any member or licensee of the Ontario Association of Architects under *The Architects Act* or any employee of such member or licensee acting under the direction and responsibility of such member or licensee from performing professional engineering services in the course of any work undertaken or proposed to be undertaken by such member or licensee as an architect;
- (c) any person who holds a certificate of qualification under *The Operating Engineers Act* from practising or designating himself as an operating engineer;
- (d) any person from practising as a bacteriologist, chemist, geologist, mineralogist or physicist;
- (e) any person from advising on or reporting on any mineral property or prospect;
- (f) any person from operating, executing or supervising any works as owner, contractor, superintendent, foreman, inspector or master,

or requires any such person to become registered or licensed under this Act in order to do any such thing. 1968-69, c. 99, s. 2.

V.3.3 The Engineering - Architecture Jurisdictional Dispute¹⁰⁹

V.3.3(a) The Statutory Background

The source of the jurisdictional dispute between architects and engineers has its roots in the fact that two separate statutory enactments have granted to these two professions exclusive power to regulate the practice of their respective professions. This section will examine the relevant legislation with respect to two major issues: first, the

extent to which the legislation defines the scope of practice of the two professions, and second, the extent to which the legislation authorizes the incursion of one profession into the domain of the other.

As we have already seen, section 1(i) of The Professional Engineers Act provides a statutory definition of the "practice of professional engineering."¹¹⁰ Section 2 then exempts certain classes of persons listed therein from the operation of the Act.¹¹¹ Of particular importance is the section 2(b) exclusion which permits architects to perform professional engineering services "in the course of any work undertaken or proposed to be undertaken as an architect."

Unlike The Professional Engineering Act, The Architects Act,¹¹² contains no explicit definition of the practice of architecture. The Act prohibits every person and corporation who is not a member of the Ontario Association of Architects from applying to himself the term "architect," or holding himself out as an architect.¹¹³ The Act then goes on to give an implicit definition of the practice of architecture by providing that "...any person or corporation who prepares for a fee, commission or other remuneration any sketch, drawing or specification for a proposed building structure or for a structural alteration of an addition to an existing building or structure, when such proposed work is to cost more than \$10,000, shall be deemed to hold himself out as an architect..."¹¹⁴ The Architects Act contains an exemption provision similar to that contained in The Professional Engineers Act:

s.16(4) Nothing in this Act prevents or shall be construed to prevent,

...

(b) any member...of the Association of Professional Engineers of the Province of Ontario...from performing architectural

services in the course of work undertaken by such member...
as an engineer.

V.3.3(b) The Case Law

The total reported jurisprudence with respect to the jurisdictional dispute between the engineers and architects is represented by the following series of cases, all of which involved prosecutions initiated by the OAA against members of the APEO for alleged breaches of The Architects Act: Regina Ex. Rel. Miller v. A.D. Margison and Associates Ltd., [1955] O.W.N. 705, 113.C.C.C. 75 (Co.Ct.); Regina v. Moll (1973), 4 O.R. (2d) 119, 18 C.C.C. (2d) 210 (Co.Ct.); and Regina v. Greer, Galloway & Associates Ltd. (1976), 11 O.R. (3d) 280 (Prov. Ct.). The cases differ with respect to the extent to which the section 16(4)(b) exemption in The Architects Act permits professional engineers to perform architectural services in the course of work undertaken as an engineer. The cases illustrate the great difficulty the courts face in interpreting the legislation with respect to delineating the scope of practice of the two professions and the extent to which the "reciprocal" exemption provisions of the two statutes authorize incursions into the traditional field of practice of the other profession.

In Regina Ex Rel. Miller v. A.D. Margison and Associates Ltd.¹¹⁵

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Macdonell, Co.Ct.J. was of the opinion that:

...while the two professions of architect and professional engineer overlap to a great extent, there are services which each is particularly qualified to perform. For example, an architect's training in architectural design, involving pleasing appearance, both inside or outside a building, is peculiar to his profession. The overlapping is demonstrated by the fact that it is usual for firms of professional engineers, such as the accused, to employ architects, and conversely for firms of architects to employ professional engineers qualified to practice.

While His Honour held that in the circumstances the accused engineer had held himself out as willing and able to perform architectural work in the construction of an office building (contrary to The Architects Act), the exemption in the Act permits professional engineers to
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perform architectural services undertaken as an engineer:

I cannot but think that it was the intention of the legislation to give reciprocal privileges,...and that it is up to a client to weigh the qualifications of firms of architects and engineers and decide which he wishes to employ, or indeed if he wishes to employ both, which is a common practice. Mr. Fleming [counsel for the OAA] contends that it is possible to decide whether a job is essentially one for an architect or for an engineer. I can find nothing in the words of the legislation which enables the Court to draw such a line between the two professions, and I do not think that the Court should endeavour to do so until the Legislature passes appropriate provisions. [Emphasis added.]

In the next reported case, Regina v. Moll,¹¹⁸ the facts were very similar to those in Margison: a professional engineer had prepared general design plans for a building and had given advice and general supervision with respect to its construction. In Moll, however, Scott, Co.Ct.J. held that the accused professional engineers had contravened The Architects Act. He disagreed with the view of the Court in Margison that it is not possible to infer from the words of the legislation whether a particular job is within the legal scope of practice of an
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architect or of an engineer:

[T]here is a very wide definition [in The Professional Engineers Act] as to what the practice of professional engineering means. Included in that are the words, steel, concrete or reinforced concrete structures and "generally all other engineering works."

While the words, "steel, concrete or reinforced concrete structures" are extremely broad I think they must be read in the context of the entire definition paragraph; as do the words "generally all other engineering works."

...

Even placing an extended interpretation on these expressions

I think it is possible to distinguish an "engineering work" and an "architectural work", within I concede, a rather narrow ambit. This approach recognizes that there may well be many "works" which fall within either category...

I interpret The Professional Engineers Act to have specifically spelled out what fundamentally constitutes the practice of professional engineering. If a work falls within this extensive definition (and because it is extensive, it must also, to some extent, be restrictive) then an engineer may perform architectural services "in the course of any work undertaken...as an engineer." The same reasoning would follow in the situation where an architect performs professional engineering services in the course of work undertaken by him as an architect...

While recognizing a work may come within both Acts, and as His Honour Judge Macdonell pointed out thus leaving it "up to a client to weigh the qualifications...and decide which he wants to employ"; any other interpretation leads to "uncertainty", "confusion" and even perhaps "absurdity." If the two Acts mean the same thing and no distinction can be drawn between them, then there is no necessity for two Acts - one would suffice to cover both professions. I cannot accept that this was the intention of the Legislature.

The final and most recent case in the trilogy is Regina v. Greer, Galloway & Associates Ltd.¹²⁰ Again, the facts are substantially

similar to the two previous cases: the accused professional engineer had prepared the plans and specifications for a school building and was being prosecuted for contravening The Architects Act. The Court's handling of the case proceeded upon the following interpretation

¹²¹
of the decision in Margison:

[O]n the basis of that particular case, one would conclude it is correct in law that both engineers and architects may design office buildings, and the client may choose which he employs...

While not disagreeing outright with the decision in Moll, Batton, Prov. Ct. J. distinguished it on the facts. The approach taken by His Honour was that if the activities of the engineer fall squarely within the definition of "professional engineering" in The Professional Engineers Act, the reciprocal privileges afforded by s.16(4)(c) of The Architects Act will protect the engineer:

...[the words] a steel, concrete or reinforced concrete structure, in my view, includes buildings... There may be structures which are not buildings, but I cannot conceive of buildings which are not structures. So, in my view, we can read s.1(i) as being, steel, concrete or reinforced concrete buildings, interchangeable with structures, for the purposes of this case, and I find no basis for giving any more limited interpretation to that word "structure."

V.3.3(c) The Scope of Practice Problem

The jurisprudence, as just described, demonstrates the problems that the Courts have faced in clearly delineating the scope of practice of the two professions. The position of the APEO is that the decisions in Margison and Greer, Galloway are correct and that the definition of the practice of engineering in s.1(i) of The Professional Engineers Act (which includes "...the designing of or supervising the construction of... steel, concrete or reinforced concrete structure...") permits professional engineers to design complete "buildings."

On the other hand the OAA position is very different. The OAA is of the opinion that the decision in Moll is correct. It asserts that the reference to "...steel, concrete or reinforced concrete structures" does not refer to the total design of "buildings" but rather refers to the "structural sub-systems of buildings."

V.3.3(d) The Proposed Revision of The Architects Act

(i) Introduction

The OAA presented to the Attorney General a draft bill for the revision of The Architects Act in 1973 which further sharpened the jurisdictional dispute between the architects and engineers. The draft bill generated a great deal of discussion and provoked intensive lobbying campaigns by the various groups who would be directly and indirectly affected by its implementation. The OAA, the APEO, individual architects

and engineers, the Canadian Manufacturers' Association, the Housing and Urban Development Association (on behalf of contractors), the Ontario Chapter of the Association of Consulting Engineers of Canada, the Ministry of the Environment and others made representations to the government. A close reading of the files of the Ministry of the Attorney General provides an indication of the type of lobbying activities carried on by these various interested parties. Because of the very controversial nature of the proposed changes, the Ministry of the Attorney General decided to delay introduction of the bill until the OAA and the APEO had worked together towards resolving the dispute between themselves. For this purpose, the OAA/APEO Joint Liaison Committee was formed. The activities and progress made by the Committee will be discussed in greater detail below.

(ii) The Draft Architects Act, 1973

This section will present the provisions of the proposed Act which have been the subject of the controversy between the OAA and the APEO.

Section 1(1)(i) for the first time gives a statutory definition of the "practice of architecture":

1(1) practice of architecture includes the doing of one or more acts of,

(i) planning or designing,

(ii) advising or reporting on the planning or designing, or

(iii) preparing plans, sketches, drawings or specifications,

for the construction of, addition to or alteration of a building or buildings.

Section 15 authorizes, for the first time, the corporate practice of architecture:

(1) Except as provided in this section, no corporation shall engage in the practice of architecture.

(2) Upon application therefore in the prescribed form and upon payment of the prescribed fee, the Board shall issue or renew a licence to a corporation to engage in the practice of architecture if,

- (a) one of the corporation's principal or customary functions is to engage in the practice of architecture;
- (b) the practice of architecture by the corporation is carried on under the responsibility and supervision of a director of the corporation who is a member; and
- (c) the beneficial ownership of the shares of the corporation is held by members to an extent not less than that set forth in the regulations.

Section 26(1) redefines the offences relating to the practice of architecture:

No person other than,

- (a) a member whose rights and privileges are not suspended;
- (b) a permit-holder whose rights and privileges are not suspended; or
- (c) a licensee whose rights and privileges are not suspended, shall,
- (d) engage in the practice of architecture;
- (e) use orally or otherwise the title "architect" or use any addition to or abbreviation of such title, or any word, name or designation that will lead to the belief that the person is entitled to engage in the practice of architecture; or
- (f) advertise, hold himself out or conduct himself as entitled to engage in the practice of architecture.

Section 21(8) includes the same provision with respect to "holding-out" as found in the former Act:

Every person that prepares or offers to prepare for a fee, commission or other remuneration any plan, sketch, drawing or specification for the construction of a proposed building of or an alteration of or addition to

an existing building, when such proposed building, alteration or addition is to cost more than \$40,000, shall be deemed to hold himself out as entitled to engage in the practice of architecture.

Finally, ss.27(b) and 27(c) revise the exemption granted to engineers:

Nothing in this Act prevents or shall be deemed to prevent,

...

(b) any member or licensee of the Association of Professional Engineers of Ontario under The Professional Engineers Act or any employee or person working under the responsibility of such member or licensee from engaging in the practice of architecture if it is supplemental and incidental to any work undertaken or proposed to be undertaken in the course of such member's or licensee's practice of professional engineering as defined in The Professional Engineers Act.

(c) any partnership, association of persons or corporation that is entitled to practise in its own name under The Professional Engineers Act in accordance with the conditions therein prescribed from engaging in the practice of architecture if it is supplemental and incidental to any work undertaken or proposed to be undertaken in the course of such partnership's, association's or corporation's practice of professional engineering as defined in The Professional Engineers Act.

(iii) The APEO Response

In opposing the proposed Architects Act, 1973 the APEO has concentrated its attack on three aspects of the new Act: the definition of the "practice of architecture"; the exemption granted to engineers; and the corporate practice of architecture.

The Definition of the "Practice of Architecture"

As we have seen, s.1(c) of the proposed Act defines the "practice of architecture" for the first time. In this regard, the APEO is concerned that the effect of the suggested definition would be to include many of the components often considered the work of an engineer into the

definition of the practice of architecture. Thus, the approach taken by the Court in Greer, Galloway would no longer be correct.

Exemption Provisions and Overlapping Fields of Professional Practice

As we have seen, at present The Professional Engineers Act and The Architects Act contain substantially similar and mutual exclusion clauses which authorize engineers and architects to carry out architectural and engineering services respectively "in the course of any work undertaken or proposed to be undertaken" as an engineer or as an architect.¹²³ However, section 27(b) of the proposed Architects Act limits the right of engineers to provide architectural services to those situations in which "it is supplemental or incidental to any work undertaken or proposed to be undertaken in the course of such member's or licensee's practice of professional engineering as defined in The Professional Engineers Act."

The APEO objects to the suggested change on two grounds. First, the APEO fears that it would unduly limit the freedom of professional engineers to perform the usual architectural services that they presently undertake in the course of their work as engineers. With the addition of the proposed definition of the "practice of architecture" in the new legislation, many of the ordinary activities now performed by engineers in relation to the structural design of buildings would constitute the practice of architecture. Absent a provision expressly recognizing and authorizing this overlapping of professional functions (which the courts in Margison and Greer, Galloway found to exist in the current legislation) the APEO fears that the Courts will unduly limit the extent to which engineers may become involved in the design of structural elements of buildings and the overall supervision and coordination of the general design and construction of buildings as "prime consultant."

Corporate Practice of Architecture

The proposed Act would permit for the first time the practice of architecture by corporate bodies.¹²⁴ The APEO has no objection in principle to the practice of architecture by corporations. It does object, however, to the proposed restrictions on the beneficial ownership of the shares of corporations permitted to practice architecture.

In this respect, the comments of the solicitors of the APEO are relevant:

We understand that the present proposal would require 60 to 75% of an architectural corporation's shares to be beneficially owned by registered architects. In the event that The Architects Act is enacted in its present form, the situation would be that an architectural corporation that could comply with the requirements of section 20 of The Professional Engineers Act, would be entitled to practice both architecture and professional engineering in its corporate name. On the other hand, an engineering corporation that had on its staff a registered architect, but which did not meet the ownership requirements under The Architects Act, could not carry on the practice of architecture in its corporate name. Presumably, however, and based on the Margison decision once again, it would be open to such an engineering corporation to hold itself out as being able to perform architectural services in the course of work undertaken in the course of its engineering practice, but this, of course, would depend to a great extent on the wording of the exemption afforded to engineering corporations in The Architects Act ...[I]n our view...if the words 'supplemental and incidental' found their way into the exemption provision, a more restrictive interpretation would be a distinct likelihood.¹²⁵

Thus, the APEO position is that engineers would no longer be able to provide the "in-house" architectural services which they now provide but would have to contract-out such work to architectural firms. This would have an adverse impact on the existence of mixed professional and multidisciplinary firms.

(iv) The OAA/APEO Joint Liaison Committee

As mentioned above, in 1973 the Attorney General delayed introduction of the proposed changes to The Architects Act pending resolution

of the outstanding issues by the OAA and the APEO. To that end, both regulatory bodies have appointed representatives to a joint committee. The committee has been meeting intermittently during the past three years but has not met with substantial success. The APEO has taken the position that any agreement reached by the Committee may not be considered official APEO policy until ratified by the APEO Council.

The OAA/APEO Liaison Committee, however, has come to a tentative agreement about the general principles upon which a resolution of the jurisdictional dispute ought to be based. It should be noted that the APEO Council has passed a resolution that the final draft, dated December 8, 1975, with amendments by the APEO Committee, dated January 15, 1976, be accepted. This resolution was carried unanimously. The following principles have been agreed upon:¹²⁶

1. Members of both professions must only undertake services they are qualified to provide;
2. Both professions encourage the retention of the appropriate professionals as required by the prime consultant;
3. Both professions agree that architects should be prime consultants for buildings where architectural considerations take precedence, with the retention of appropriate registered engineers for the engineering aspects of the work. Similarly engineers should be prime consultants for building projects where engineering considerations clearly take precedence, with the retention of registered architects for the architectural aspects of the work.
4. The interests of the professions and public would be served by the formulation of guidelines which would define the responsibilities of both professions and define building types appropriate for the prime consultancy of each profession.

A draft list of the types of projects in which architectural and engineering considerations respectively take precedence has also been prepared.

V.3.4 The Role of the Engineering Technician and Technologist¹²⁷

At present engineering technicians and technologists are not subject to any regulation as such. (It will be recalled that membership in the Ontario Association of Engineering Technicians and Technologists [OACETT] is strictly voluntary and not a condition precedent to either holding oneself out as an engineering paraprofessional or to the practice of "engineering technology.")

The following passage taken from The Engineering Technologist, a study done for the Ministry of Colleges and Universities of the Province of Ontario¹²⁸ gives a fairly concise historical background to the role of the engineering technologist in Canadian industry:

Language, custom, economics, science and politics have all combined to influence the role of the engineering technologist in Canadian industry. Because of some of these factors and in spite of others, engineering technologists began to emerge in Canada as a visibly new occupation group about 25 years ago.

Canada was not a leader in the development of this category of industrial personnel. The European forerunner of the Canadian engineering technologists, the graduates of post-secondary programs in Germany, Holland, Italy, Switzerland, Denmark, Sweden, Norway, France and almost every other industrialized country, had been identified by such titles as Ingenieur, Techniker, Technicien, Geometer, etc. In Britain, a system of apprenticeships co-ordinated with part-time day release educational programs produced similar graduates who became known as 'engineers'.

These European graduates soon earned a place in industry and gained recognition as practitioners of 'industry engineering'. Their tasks were focused upon solving day-to-day technical problems associated with the operation and maintenance of industrial processes in the broadest sense.

With the exception of Britain, the technical universities of Europe produced smaller numbers of Diplom Ingenieurs

and Doktor Ingenieurs, those who were readily identified as 'professional' engineers and who undertook the roles of researchers, consultants, teachers and managers of engineering functions. The British, as well, graduated their 'professional' engineers from universities, but they also provided a means for the day release apprentices to achieve professional status by examinations leading to membership in various Institutions of Engineers and to the title Chartered Engineer.

Languages other than English permitted a clear distinction between the professional Doktor or Diplom Ingenieur and the Ingenieurs, Technikers, Techniciens and Geometers. The difference in title readily implied a difference in qualification and hence in role. Each occupational group was easily recognized and had its own place in society.

In Britain, perhaps because of the step-by-step approach they had adopted, there was no such distinction of titles or roles. Although the 'engineer' might eventually become a Chartered Engineer, the roles of the two occupational groups frequently were blurred and confused. As part of the long established patterns of British migration to this country, Canada seemed to have inherited the confusion attached to these titles. The newly-arrived British 'engineers' might or might not be recognized by the Canadian professional associations as Professional Engineers. However, it appeared to have been convenient and economically desirable for industry to observe and adopt the British customs. The provincial associations of professional engineers had neither enough strength nor enough cohesion to provide the leadership necessary to counter what was happening.

This situation prevailed until the late 1950's. Research aimed at permitting man to explore space was beginning to produce almost exponential increases in scientific knowledge. A booming economy was expanding the demand for Canadian technical manpower, and predictions indicated the need for a greatly increased production of technically trained people.

It was then that the Association of Professional Engineers of Ontario realized that Canada already contained an occupational group which was an integral part of the engineering team. They were the Ingenieurs, Technikers, Techniciens, Geometers and 'Engineers' who had come to

Canada in large numbers after World War II. It was recognized that the engineering profession must encourage the training, development and recognition of Canadians to fill the anticipated demand for technically trained people. Thus emerged the APEO's program for the Certification of Engineering Technicians and Engineering Technologists. The titles they adopted were an attempt, within the limitations of the English language, to imply a different role from that of the professional engineer.

At this point reaction began to set in. The European immigrants, in many cases, had already been identified by industry as engineers even though the APEO had not extended recognition to them as such. The immigrants interpreted the title Engineering Technologist as being something less than what they had already achieved. In essence, they suspected that the new title was just a ploy being used by the APEO to place limits upon them.

At the same time, graduates of the then Ryerson Institute of Technology and of the Haileybury School of Mines resented the intrusion of the APEO into an area that they had felt to be their prerogative. Their views received sympathetic support from graduates of the other four Institutes of Technology.

In spite of the conflict, the APEO's certification program grew and was copied by professional engineering associations in other provinces of Canada and by the National Society of Professional Engineers in the United States. Eventually, in 1962 the Ontario Association of Certified Engineering Technicians and Technologists emerged as the spokesman for those engineering technicians and technologists who were attempting to establish a professional identity.

The political institutions of our society have also exerted a beneficial effect. In 1967, faced with the possibility of large numbers of students graduating from high school with no prospect of employment, the Ontario Government created the Colleges of Applied Arts and Technology. With the exception of Ryerson, the original Institutes of Technology were absorbed into the college system. Suddenly there was a province-wide educational system capable of producing a large number of engineering technicians and technologists. As they increase numerically and as their roles become more clearly understood, the pressure for professional identity can be expected to increase."

The following passages from The Engineering Technologist¹²⁹

summarize that study's findings with respect to the working and professional role of the engineering technologist vis a vis the professional engineer:

Identifying the role of the engineering technologist has been difficult because of the overlapping qualities evident in the different roles played by various members of the engineering team. The field of engineering activity has great breadth, and a person of a certain skill can operate at widely different levels of responsibility depending upon the degree of technical sophistication required by the function in which he is participating. The network of functional relationships which exists is illustrated by Matrix 5:1.

An engineering technician might direct a group whose function is the maintenance of complex process equipment but would normally be limited to a support role in a group whose function is the design and development of the same process equipment.

An engineering technologist might be in charge of a group designing and developing production machinery which is an extension of, enlargement of, or improvement on the existing facilities. He would likely be engaged in a supportive role within a group creating the engineering concept of a completely new process.

The data generated by this research tend to confirm the concepts outlined above. Engineering technologists are holding positions of senior responsibility such as Chief Executive, Director and General Manager; they have attained middle management positions mainly in manufacturing and sales organizations, and they have achieved positions of responsibility in areas of design and construction where technical competence is a major criterion for selection.

On the other hand, the index of activities engineering technologists perform (Appendix B, Table IV) shows that they are most frequently engaged in activities of a supportive nature. Since the largest portion was from manufacturing, it must be concluded that many technologists are functioning in the role of technicians. It is the less frequently performed activities which conform with the role of the engineering technologist.

At the same time, however, employers have demonstrated that there is a place for engineering technologists in the occupational hierarchy. The demand for them is indicated by the fact that 95.08% of the 875 technologists who participated in this research had put their technology training to use by working at some time during their careers in a technical capacity.

Matrix 5:1 - Typical Roles of the Engineer, Technologist and Technician

Classification → Group ↑ Function	Professional Engineer	Engineering Technologist	Engineering Technician
Engineering Science or Innovative Engineering	Problem analysis Synthesis of solutions Direction of R & D Engineering concepts	Development of: models pilot plants prototypes Supervision of drafting	Testing Specifications Drafting
Engineering Practice	Design of processes of systems Direction of: product design equipment design development Technical sales	Product design Equipment design Design of test equipment Development of test procedures Recolution of production problems Technical sales	Assist with: design development Supervise: testing specifications drafting
Engineering Technology	Training and development Plant engineering Maintenance engineering Production engineering Application engineering Technical sales	Supervision of: design development maintenance production Production engineering Plant engineering Application engineering Technical sales	Time & motion study Production super- vision Maintenance planning Supervise: testing specifications drafting Design calculations Selection of components

Table IV - Job Activities in Descending Order
of Frequency

<u>Index</u>	<u>Job Function</u>
7.93	Reading/interpreting drawings
7.45	Supervise work of subordinates***
5.29	Design equipment/systems
5.25	Write specifications/reports
4.50	Basic design/layout
4.03	Repair/install equipment
3.79	Basic/applied research or development
3.57	Carrying out calculations
3.17	Estimating quantities/costs
3.07	Quality control
2.99	Teaching and training
2.89	Inspect/test materials/machinery
2.82	Collecting data or samples
2.67	Consult/advise clients/customers***
2.66	Drafting
2.25	Technical sales
2.10	Write letters and memos
2.08	Keep records
2.08	Manage construction***
2.03	Exploration or inspection
1.83	Chemical testing/analysis
1.81	Scheduling
1.81	Methods Analysis
1.67	Plan future operations***
1.61	Production planning/control***
1.40	Surveying and measuring
1.29	Operate/program computers
1.12	Direct a portion of manufacturing operations***
1.11	Purchasing
0.92	Make forecasts, estimate markets***
0.88	Analysis of statistics
0.86	Direct plant engineering function***
0.74	Budget, allocate expenditures***
0.74	Negotiate contracts/raise funds***
0.62	Establish company/division objectives***
0.62	Establish business strategies***
0.56	Forecast manpower requirements***
0.51	Direct complete manufacturing operations***
0.42	Time and motion study
0.23	Value analysis
0.19	Search/select literature
0.09	Recruiting
***	Management activities

V.4 Structure and Form of Firms

V.4.1 Statutory and Regulatory Requirements: Incorporation, Partnership and Ownership Rules

A corporation, partnership or association of persons may carry on the practice of engineering in its own name if it holds a certificate of authorization issued by the Registrar of the Association of Professional Engineers of Ontario. Section 20 of The Professional Engineers Act prescribes the rules applicable to practice of engineering by corporations, partnerships and associations of persons:

20.—(1) No partnership, association of persons or corporation as such shall be a member or a licensee, or shall, except as authorized by this section, practise professional engineering. 1968-69, c. 99, s. 20 (1).

(2) A partnership, association of persons or corporation that holds a certificate of authorization may, in its own name, practise professional engineering,

- (a) if one of its principal or customary functions is to engage in the practice of professional engineering; and
- (b) if the practice of professional engineering is done under the responsibility and supervision of a member of the partnership or association of persons, or of a director or full-time employee of the corporation, as the case may be, who,
 - (i) is a member, or
 - (ii) is a licensee, in which case the practice of professional engineering shall be restricted to the work specified in the licence of the licensee. 1968-69, c. 99, s. 20 (2), *amended*.

(3) A partnership, association of persons or corporation that desires a certificate of authorization shall submit to the registrar an application in the prescribed form containing,

- (a) the names and addresses of all its partners, members, officers or directors, as the case may be;
- (b) the names of all its partners, members of associations of persons, directors of corporations, or full-time employees of corporations, as the case may be, who are the members or licensees who will be in charge of professional engineering on its behalf;
- (c) from among the names specified under clause ~~b~~ the name or names of its official representative or representatives whose duty it is to ensure that this Act, and the regulations and the by-laws are complied with by the partnership, the association of persons or the corporation, as the case may be,

and shall, whenever there is a change in the particulars given in its application, give notice of the change to the registrar within thirty days after the effective date of the change.

(4) If subsection 3 is complied with, the registrar shall issue to the applicant a certificate of authorization.

(5) Where the holder of a certificate of authorization ceases to have any official representative, the certificate is *ipso facto* revoked, and the partnership, association of persons or corporation shall not practise professional engineering until a new certificate of authorization is issued.

(6) Where the council finds that the holder of a certificate of authorization has failed to observe any of the provisions of this section or has been guilty of conduct that would, in the case of a member or licensee, have been professional misconduct, the council may reprimand the holder or suspend or revoke the certificate of authorization.

(7) Sections 24, 25 and 26 apply *mutatis mutandis* to the refusal to issue a certificate of authorization and to the revocation or suspension of a certificate of authorization. 1968-69, c. 99, s. 20 (3-7).

Also relevant is s.94 of APEO By-Law No. 1 which provides:

94. (1) A partnership, association of persons, or corporation, practising professional engineering in its own name must hold a certificate of authorization as prescribed in section 20 of the Act.
- (2) Application shall be made to the registrar providing the information required by subsection 3 of section 20 of the Act.
- (3) Provided that the terms of the Act are complied with, the registrar shall issue to the applicant a certificate of authorization which shall be valid for the remainder of the calendar year in which it is issued and is renewable annually thereafter on the first day of January in each year.
- (4) The Association shall maintain a system for the listing and recording of partnerships, associations of persons, or corporations, to whom certificates of authorization have been issued, which shall include the particulars required under subsection 3 of section 20 of the Act.

The issuance of certificates of authorization has been discussed in greater detail in Section III: Qualifications and Entry Into the Profession. It is important to emphasize that neither The Professional Engineers Act nor the Council of the APEO have prescribed any rules with respect to the ownership of a firm or corporation carrying on the practice of engineering in its own name. The APEO is opposed to the imposition of minimum professional ownership requirements. At present, firms and corporations may be disciplined in several ways:

- (i) the firm or corporation may be disciplined in the same manner as a member of the Association;
- (ii) the certificate of authorization may be revoked;
- (iii) the individual professional engineer under whose responsibility and supervision the practice of engineering is done may himself be disciplined.

The APEO takes the position that the disciplinary powers available to the Council provide enough control over the activities of companies not owned by professional engineers so that legislation restricting ownership of shares in engineering firms to professional engineers is not required. Such a requirement would exclude public companies like Westinghouse Canada Limited from practising engineering. The names of all firms and corporations authorized to practice engineering in Ontario are listed in the APEO

Directory of Firms and Corporations.

V.4.2 Associated/Mixed Professional

The statutory provisions of The Professional Engineers Act permit groups of associated/mixed professionals to engage in the practice of engineering so long as one of their primary or customary functions is to engage in the practice of engineering and they meet the supervisory requirements of section 20. Thus firms of architects, construction companies, planners and other related professions may have engineering departments and carry on the practice of engineering if they have received a certificate of authorization. Conversely, engineering firms may provide architectural, construction and planning services.

Another way in which associated professionals cooperate is in the form of a joint venture. There are several kinds of joint ventures in which engineering consultants are regularly engaged:

- a) consultants with other consultants as a design consortium;
- b) consultants and project managers as a design-management team;
- c) consultants and contractors as a design-build team;
- d) consultants, project managers, and contractors as a Turnkey consortium. [A 'Turnkey consortium' may be defined as a project 'for which the professional architectural and/or engineering services are performed by one party and where actual construction, installation, erection, fabrication, assembly or manufacture thereof is also performed by the same party or by an associated¹³⁰ business enterprise in which he is involved.'

One of the most significant developments in the engineering profession during the past fifteen or twenty years has been the increasing trend towards multi-disciplinary approaches to solving engineering problems. This trend may be attributed to two significant factors: first, the scope and size of projects have been steadily increasing; and second, the number of various elements (such as environmental

protection, urban planning, public participation) that must be incorporated into engineering planning models also have been increasing. As a result of these factors engineering firms may now employ or enter into joint ventures with the following types of associated professionals:

- architects
- economics consultants
- landscape architects
- aerial surveyors
- planning consultants
- market surveyors
- soils consultants
- urban designers
- market surveyors
- public transit consultants
- sociologists
- other consulting engineers

V.5 Advertising

V.5.1 Control of Advertising

Engineers are free to advertise and solicit business in any manner that is not inconsistent with the Code of Ethics. The first Code of Ethics adopted by the APEO in 1923 contained two provisions directly affecting advertising and solicitation: section 3 provided that the engineer "shall advertise only in a dignified manner, being careful to avoid misleading statements"; section 6 provided that "[h]e shall refrain from using any improper or questionable methods of soliciting professional work and decline to pay or to accept a commission for securing such work." These two provisions remained in effect until 1948 when

provisions were exacted substantially similar to those contained in the current Code of Ethics. Three provisions in the subsisting code are relevant: first, section 5(c) states that a professional engineer shall "not maliciously injure the reputation or business of another professional engineer"; second, section 5(d) states that he shall "not attempt to gain an advantage over other members of his profession by paying or accepting a commission in securing professional engineering work"; and finally, section 5(e) provides that he shall "not advertise in a misleading manner injurious to the dignity of his profession, but shall seek to advertise by establishing a well-merited reputation for personal capability." The only really significant change effected by the new Code is the deletion of the section 6 solicitation provision. Indeed, by encouraging engineers to advertise by "establishing a well-merited reputation for personal capability" the Association implicitly sanctions "tasteful" solicitation. The only general guideline given by the Association with respect to advertising is a pamphlet published by the APEO entitled "Advertising: Professional Engineers." The "suggested rules" mentioned in the pamphlet were established and approved by the ten provincial regulatory bodies in conjunction with the Canadian Council of Professional Engineers. The pamphlet points out, however, that the rules "represent the consensus of professional engineers' opinions across the country as to what is appropriate, but they are not mandatory from legal or ethical standpoints." The pamphlet is reproduced in full herein.

ADVERTISING WHICH MAY BE NATIONAL IN SCOPE

Professional Cards—Shall not exceed 2 inches by 3½ inches in size and shall be limited in content to the following information:

- Name of the engineer
- Business affiliation
- Telephone number
- Address
- Degrees and titles
- Professional organization membership
- Engineering and/or scientific society membership
- Specialties in which the engineer practices
- Date of founding of the firm

Telephone Directories—Advertising in the yellow pages of telephone directories is permitted, but shall include only that information approved for professional cards.

Newspapers and Magazines—May be employed for advertising professional services and announcing personnel changes or additions, but such advertisement must be limited in size to sixteen square inches and must contain only that information approved for professional cards.

Personal photographs may be used provided they be restricted to one insertion per publication and of the head and shoulder type not exceeding a width of one standard column of the newspaper and/or magazine. Text material accompanying personal photographs shall be restricted to information approved for professional cards and brief biographical notes on the individual.

An engineer may also prepare articles describing projects of special interest in which he has participated for publication in technical magazines or newspapers, but he shall not pay in any way to ensure publication of such articles, except the usual nominal 'page charges' made by many technical journals.

Vehicle Identification—Shall be limited to the panels of front doors, or comparable area. It shall state only the engineer's name, address and specialty.

Letterheads—Letterheads shall contain only that information approved for professional cards; however, listing of professional engineers and key personnel shall be permitted.

Radio and Television—Radio and television advertising is not permitted. An engineer may, however, participate in a radio or television interview of similar program to discuss the technical or professional aspects of his work, but he shall not pay in any way to ensure his appearance on such programs.

Use of Seal—The professional seal of an engineer or the seal of his professional association shall not be used for advertising or commercial purposes.

Gifts and Gadgets—Promoting or advertising engineering services by means of gifts or gadgets such as calendars, pencils or other objects is not permitted.

Brochures—A brochure may be published to inform specific prospective clients about the engineer's experience and organization. Such a brochure must be factual and accurate and may contain photographs and illustrations and any technical information necessary to enable the prospective client to judge the experience and capability of the engineer and his organization. However, it must not be used for wide and general publicity.

Engineers are urged to submit a draft of any proposed brochure to their professional association for approval.

Leaflets and Circulars—Leaflets and circulars other than brochures as outlined above are not permitted.

However, public relations or educational type pamphlets published on a collective basis to publicize the services which the engineering profession can render to the general public or to specific groups may be published, subject to the approval of the professional association having jurisdiction.

Insignia, Symbols and Motifs—May be used on business stationery, professional cards, jobsite signs, office signs, or vehicle identification signs. Such insignia, symbols and motifs shall not be used for any other purpose.

Products—An engineer shall not link his name to a product, process or method which he uses or specifies in an advertisement sponsored by those interested in the sale of such product, process or method

Others—For publicity of any type not dealt with in this section, engineers shall consult their professional association.

LOCAL ADVERTISING

Jobsite Signs—An engineer may advertise on the site of a project, in which he participates, but such signs shall be reasonable in size, dignified and shall be limited in content to that information approved for professional cards, except that the only specialty mentioned shall be the type of work being done on the project.

Billboards—Billboard advertising shall not be used except on project directory-type signs.

Office Signs—Office signs are permitted, but must not exceed 20 square feet in size, be dignified and in good taste and may contain only the name of the individual or firm, type of practice and insignia, symbol or motif.

Other Local Advertising—For other types of local advertising not dealt with in this code, engineers shall consult their professional association.

V.5.2 Methods of Advertising

The following list represents the principal means by which engineers advertise their services to the public and to other engineers.

(a) Directories

(i) The APEO Directory of Members

This is the official list of the members of the APEO. It merely lists the name, address, and current place of employment of each member. As such, it does not provide much information about the type of service offered by each person. Indeed, most of the persons listed in the directory are employee engineers who are not involved in the "business" of providing engineering services.

(ii) Directory of Firms and Corporations

This document, published by the APEO, merely lists the names and addresses of firms and corporations which practise professional engineering in their own name and have received a certificate of authorization from the APEO to do so. Like the APEO Directory of Members it is not a very effective advertising tool.

(iii) Directory of Consulting Engineers

This directory is published by the Association of Consulting Engineers of Canada. It lists the name and address of every consulting firm in Canada which belongs to the ACEC. It also lists the experience of each firm and provides a description of the type of work and services it is capable of performing. The directory is distributed to all persons who might possibly use the services of engineering consultants.

(iv) Telephone Directories

(b) Advertisements in Newspapers, Magazines and Trade Journals

Consulting firms often will pay for space in these publications

to advertise their services. Examples of such advertisements may be found in the various engineering journals. The advertisements are fairly uniform in format and are relatively restrained in their content.

(c) Office Signs

(d) Jobsite Signs

Upon each construction site where an engineer's services have been used, his name will be displayed on a fairly large sign along with others (for example, the contractor, architect, consultant) whose services have also been used.

(e) Calling Cards

(f) Motifs, Insignia, Logos

Engineers often use logos on all their stationery, calling cards, jobsite signs and other advertisements.

(g) Specialist and Consultant Designation

Engineers who have been designated as specialists or consultants may make this fact known in all of their advertising.

(h) Solicitation

As we have already mentioned above, engineers may engage in the solicitation of business. This activity is carried on in several ways:

(i) Brochures

Many large consulting firms have prepared attractive (sometimes rather glossy) brochures outlining the history of the company, its organizational structure and the type of services it performs, a description of the projects it has worked on in the past and a list and biography of its personnel (sometimes with photographs of past projects and major personnel). These brochures are distributed to potential clients.

(ii) Project Proposals

When a consulting firm is in competition with others for a job, it will usually present a project proposal to the client which, in addition to most of the information contained in its brochure, will contain a description of the way in which it intends to carry out the project and sometimes also a cost estimate.

(iii) Personal Contacts

Because the practice of consulting engineering is very much a "business" much solicitation takes place in a very informal manner through the nurturing of contacts on a personal basis. Thus, a large part of the time of an executive of a consulting firm is spent in lunching and entertaining clients and potential clients.

(iv) Advertising of Fees

The only manner in which consulting firms engage in the advertising of fees is in the context of a proposal for a specific project. Otherwise, it is usually not done in any formal manner.

V.6 Remuneration

V.6.1 Fee Schedule and Performance Standards

The Council of the APEO publishes a "Scale of Fees" and an accompanying description of "Performance Standards." The scale of fees and performance standards are initially developed and drafted by the Consulting Practice Committee of Council. The terms of reference of
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the Consulting Practice Committee provide, inter alia, that:

The consulting Practice Committee Shall:
...(c) advise the Council on matters pertaining to consulting engineering such as:...

- (iv) fee schedules;
- (v) forms of agreement;...
- (viii) performance standards.

The formulation of the scales of fees essentially involves a four-stage process:

- (1) The Consulting Practice Committee draws up a preliminary schedule.
- (2) The Committee contacts and shows the preliminary schedule to various government ministries and other major clients who utilize the services of consulting engineers.
- (3) The Committee revises the schedule (if necessary) to accommodate the views of the clients.
- (4) The Council approves, modifies or rejects the schedule.

While the consultation with government and other clients does not legally bind these clients to accept the fee schedule, they do provide the APEO with a good indication of the acceptability of the fee schedule as a basis for negotiating the price of engineering services.

The performance standards inform the client of the kind and extent of services that the consulting engineer should perform for the client and tie the particular type of service to an appropriate method of setting the fee. At present there are eight different Performance Standards:

- (1) Consulting Engineering Services to the Urban Development Industry;
- (2) Project Management Services;
- (3) Consulting Services for the design of Roads and Bridges;
- (4) Advising on and Reporting on Oil, Gas and Mineral Properties;
- (5) Consulting Services to Municipalities;
- (6) Consulting Services for Architects;
- (7) Consulting Services for General Engineering Projects; and
- (8) Consulting Services for Building Projects.

The APEO describes the nature of its scale of fees in the following manner: ¹³²

Fees for Consulting Engineering Services are determined on the basis of the size and complexity of the project and the professional qualifications of the Engineer concerned.

The Scales of Fees represent an equitable basis for the remuneration of a Professional Engineer, whether practising as a sole practitioner, in partnership or in an incorporated practice. They are considered to be the minimum levels below which competent and responsible Consulting Engineering Services cannot be provided. Adequate engineering is not lower in cost when selected by competitive bidding methods and, furthermore, when professional services are derived in this manner they may not be either objective or in the best interests of the client.

(The regulatory consequences of non-adherence to the fee schedule and performance standards will be discussed infra in Section V.6.2.) It should be noted that the fee schedule and performance standards are published in a blue binder which is readily available to anyone upon request with payment of a small fee.

In order to illustrate the nature of the performance standards and the various methods and levels of charges recommended by the APEO excerpts are set out from the "Scales of Fees and Guide for the Engagement of Consulting Engineering Services - Building Projects" published by the APEO.

CATEGORIES OF SERVICE

CATEGORY I ADVISORY SERVICES (Scale 1)

These are of an advisory nature and include such services as testimony, consultation and advice, appraisals, valuations, rate structure and tariff studies, research or other services leading to specialized conclusions and recommendations.

CATEGORY II PRE-DESIGN AND FEASIBILITY STUDIES (Scale 1)

These services consist of preliminary engineering studies and the collation and processing of information for the purpose of selecting one of several alternative plans or courses of action relative to the project. Generally included are such matters as exploration, gathering of topographical data and other site conditions, sub-soil investigation, preparation of traffic studies, analysis of conditions or of several alternative plans, economic study of capital, operating costs and other financial considerations, and similar matters leading to conclusions based on which recommendations for the project will be made.

CATEGORY III PRELIMINARY PLANS AND SPECIFICATIONS (Scale 1 or Scale 2)

These services consist of the preparation and submission of sketch plans, outline specifications, preliminary estimates of the project costs and schedules for the completion of work. They will clearly indicate the concept of the project for approval and acceptance by the Client on the basis of the pre-design data for the alternative plan or course of action decided upon under CATEGORY II, or on complete design data provided by the Client.

**CATEGORY IV FINAL PLANS AND SPECIFICATIONS
(Scale 1 or Scale 2)**

These are based on the approved preliminary plans and specifications and consist of the preparation of final designs and cost estimates, working drawings, specifications and contract documents ready for tender and/or construction. Also included are the analysis of tenders and recommendations for the construction work.

**CATEGORY V GENERAL ADMINISTRATION DURING
CONSTRUCTION (Scale 1 or Scale 2)**

These consist of office and field services during the construction period following the award of contract, attendance at job meetings, approval of certificates of contractors' payment and general follow-up of construction with respect to progress, cost and schedules, review of shop drawings, consideration of alternative materials and construction methods proposed by the contractor, preparation of change orders, obtaining of warranties and guarantees, and certification of contract completions.

**CATEGORY VI RESIDENT SERVICES DURING
CONSTRUCTION (Scale 1)**

These consist of supplying resident staff on the project to determine if the contractor is carrying out his work in accordance with the contract documents. This work is carried out as an additional service and is compensated accordingly. They are provided on a full or part-time basis and generally consist of the following:

- a) Ensuring that all work will satisfy the intent of the design and will conform substantially with plans and specifications;
- b) Arranging for and carrying out all necessary field testing of materials and equipment installed;
- c) Investigating, reporting on and advising on unusual circumstances which may arise during construction;
- d) Preparing contractor's payment certificates;
- e) Detailed final inspection, liaison and other assistance required to expedite the acceptance and takeover of the work by the Client or other agency;
- f) Calling job meetings and generally following up on costs, schedules, etc;

- g) Recording all details of construction necessary to modify contract drawings to show the work as built.

A clearly-defined written agreement should be made between the Client and the Engineer outlining the extent to which Resident Services are to be provided.

ADDITIONAL AND SPECIAL SERVICES

These are additional or special services which are not included under the six categories of service. Unless specifically provided for in a percentage fee, they are carried out under Scale 1 — Time Basis.

The following list is intended to indicate areas and services which may vary from project to project.

1. Soil investigations and surveys, and measurements other than profiles and cross-sections required for design purposes.
2. Revising completed, or substantially completed, design documents and the preparation of additional plans, specifications and/or contract documents.
3. Preparation of reinforcing bar schedules, as-built drawings if not prepared under Resident Services, and detailing of landscaping.
4. Special visits to the site to deal with extraordinary or extensive site problems or situations unforeseeable during the design stage.
5. Coordination of separate construction contracts and other consultants' work, detailed cost estimates, procurement and scheduling of special applications for grants, loans and tax rebates.
6. Computer services, except where a computer is used for design under the percentage scale or for the Consulting Engineer's normal office administration.
7. Operating manuals, start-up of plants, training operating personnel.
8. Preparation of special theoretical designs, reports and documents required for the approval and financing of a project.
9. Translation of contractual documents, conversion to metric units, preparation of drawings for reduction.
10. Extra services which are required when other parties, other than the Client, code and regulatory authorities, control or influence the work and require the Engineer to revise designs or specifications.

FEE SCALES

The Consulting Engineer performs his services on a professional fee basis. The Scales of Fees given herein set out minimum levels to be charged for consulting services conforming to the categories described.

Fees may be based on the following scales:

SCALE 1 — TIME PLUS REIMBURSEMENT FOR DEFINED EXPENSES

SCALE 2 — TABLES 1 to 4 — PERCENTAGE OF COST OF CONSTRUCTION PLUS REIMBURSEMENT FOR DEFINED EXPENSES

— TABLE 5 — TIME PLUS PERCENTAGE OF COST OF CONSTRUCTION PLUS REIMBURSEMENT FOR DEFINED EXPENSES

The extent by which the fee charged by a particular Engineer may exceed the minimum published fee will vary with the standing and specialized knowledge of the Engineer concerned as well as with the nature and extent of his work and the responsibility involved.

EXPENSES AND DISBURSEMENTS

In addition to the fee, the Engineer shall be reimbursed for all expenses properly incurred by him in connection with the project including, without limitation, reasonable travelling and living expenses, long distance telephone calls and telegraphs, special reproductions, printing of documents for Client approval and/or construction purposes in excess of 15 sets, special delivery and express charges, site offices for resident staff and overtime premium payments if approved by the Client in advance.

The Engineer shall also be reimbursed for disbursements in connection with approved special consultations for sub-surface investigations and chemical and physical tests, plus a charge of 10 percent levied against these specific disbursements.

PAYMENT

In the case of percentage fees, 80 percent of the total fee for Design and General Administration During Construction is due to the Engineer upon completion of the final plans, specifications and contract documents. The remaining 20 percent of the fee will be pro-rated throughout the construction period until the fee is paid in full.

In the event that the preparation of the design documents extends over a period of months, partial payment will be made pro-rated on the basis of the design work completed.

These fee scales have been established on the understanding that fees, including expenses and disbursements, will be paid within 30 days after the Engineer has forwarded his statement to the Client. Payment beyond this period may be subject to carrying charges as agreed between the Client and the Engineer.

DEFINITIONS

Cost of Work

- a) The "cost of work" shall mean the total cost to the Client of the project, including all materials, equipment, labour and contractors' overhead and profit, necessary to complete the work for which the Engineer prepares designs, drawings, or specifications, or for which he is responsible.
- b) Whenever the Client furnishes material, equipment, labour or any other service which is incorporated in the work, the fair market value of such material or equipment as though it were purchased new, and the current price of such labour or other service when the work was executed shall be used to compute the cost of the work.
- c) Whenever used material or equipment is furnished by or on behalf of the Client, the fair market value of such material or equipment as though it were purchased new shall be used to compute the cost of the work.
- d) In computing the cost of the work, no deductions shall be made on account of any penalties or damages claimed by the Client from any Contractor or on account of any other sum withheld from any Contractor.
- e) The cost of the work shall not include any fees and disbursements due to the Engineer.

Payroll Cost

Payroll cost means salary plus provision for statutory holidays, vacations with pay, unemployment insurance where applicable, health and medical insurance, group life insurance, pension plan, and sick time allowance. It shall exclude any bonus or profit sharing system.

Time Expended

All time expended on the assignment, whether in the Engineer's office, at the Client's premises, or elsewhere, shall be chargeable, including clerical staff engaged on the preparation of documents such as reports, specifications, etc.

Site

"Site" includes the actual work site and other locations where the checking of materials, equipment and/or workmanship is carried out.

Executive Engineer

For fee purposes, this title applies to individuals in a consulting engineering organization who have administrative authority in addition to their engineering responsibilities, even though they may not be principals or officers of the firm.

BUILDING PROJECTS

SCALE 1 — TIME BASIS

Scale 1 is to be used for the following categories:

- CATEGORY I — ADVISORY SERVICES
- CATEGORY II — PRE-DESIGN AND FEASIBILITY STUDIES
- CATEGORY VI — RESIDENT SERVICES DURING CONSTRUCTION

and may be used as an alternative to Scale 2 for:

- CATEGORY III — PRELIMINARY PLANS AND SPECIFICATIONS
- CATEGORY IV — FINAL PLANS AND SPECIFICATIONS
- CATEGORY V — GENERAL ADMINISTRATION DURING CONSTRUCTION

SCALE 1

Principals and Executive Engineers rendering individual services on special assignments for which they are eminently qualified and for which they require little or no staff assistance

50% more than rates for normal assignment

Principals and Executive Engineers on normal assignments

Not less than \$200 per normal working day

Staff Time

Payroll cost multiplied by a factor of not less than 2.0

These fee scales have been established on the understanding that fees, including expenses and disbursements, will be paid within 30 days after the Engineer has forwarded his statement to the Client. Payment beyond this period may be subject to carrying charges as agreed between the Client and the Engineer.

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- c) Whenever used material or equipment is furnished by or on behalf of the Client, the fair market value of such material or equipment as though it were purchased new shall be used to compute the cost of the work.
- d) In computing the cost of the work, no deductions shall be made on account of any penalties or damages claimed by the Client from any Contractor or on account of any other sum withheld from any Contractor.
- e) The cost of the work shall not include any fees and disbursements due to the Engineer.

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Payroll cost means salary plus provision for statutory holidays, vacations with pay, unemployment insurance where applicable, health and medical insurance, group life insurance, pension plan, and sick time allowance. It shall exclude any bonus or profit sharing system.

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All time expended on the assignment, whether in the Engineer's office, at the Client's premises, or elsewhere, shall be chargeable, including clerical staff engaged on the preparation of documents such as reports, specifications, etc.

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"Site" includes the actual work site and other locations where the checking of materials, equipment and/or workmanship is carried out.

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Principals and Executive Engineers on normal assignments

Not less than \$200 per normal working day

Staff Time

Payroll cost multiplied by a factor of not less than 2.0

Full-Time Resident Staff (CATEGORY VI) Payroll cost multiplied by a factor of not less than 1.7, except when Categories of Service III and IV have been completed by others, then payroll cost will be multiplied by a factor of not less than 2.0

Part-Time Resident Staff (CATEGORY VI) Payroll cost multiplied by a factor of not less than 2.0

BUILDING PROJECTS

SCALE 2

TABLES OF FEES

A Table of Fees follows for building projects in each of two broad classifications:

- a) **TABLES 1 - 4 — PERCENTAGE OF COST OF CONSTRUCTION**
for projects involving the basic engineering disciplines;
- b) **TABLE 5 — TIME PLUS PERCENTAGE OF COST OF CONSTRUCTION**
for projects of above-average complexity involving advanced technology and the coordination of several technical disciplines.

Scale 2, Tables 1 to 4 and Table 5, should be used to determine the fee for the total combined services under Categories of Service III, IV and V, where feasibility and preliminary cost estimates for the construction and/or installation of the project have been established in the Pre-design phases of the work, or are available from the Client. It does not cover services performed under Categories I, II or VI, nor the Additional and Special Services listed on Page 7.

It is emphasized, in the interests of both the Client and the Engineer, that the Engineer retained for Design Services should also be retained for General Administration During Construction. If, however, the Engineer is not so retained, the fee for Design Services only shall be 80 percent of the tabulated percentage fee.

Where the Cost of Construction is near the lower limit of one of the Cost of Work divisions, the fee shall not be less than that which would have been received at the upper limit of the previous Cost of Work division.

The list of projects in each of the Tables is not complete but is intended to indicate the types of buildings envisaged for each Table.

SALES TAXES

Scale 2 fee structure is based on the assumption that sales taxes are included in the cost of work. When sales taxes are not included in the cost of work, the fee shall be adjusted upwards by a factor equivalent to the sales taxes. The adjusted fee may be computed to the nearest one quarter of one percent.

SEPARATE CONSTRUCTION CONTRACTS

Where separate construction contracts are required by the Client for a single project, the details should be negotiated between the Client and the Engineer before design work begins. In some cases, the fee may be calculated on the basis of cost of work determined from each separate contract. In other cases, the extra work involved by the Engineer may be charged as an additional service.

FEES FOR SUPPORT ENGINEERING SERVICES

When the prime consultant retains sub-consultants for various portions of the design, the fee for these services shall be 75% of the prime consultant's fee for that portion of the work.

BUILDING TABLE 1

APPLICATION

Communications Buildings

TV and Radio Buildings

Computer Centres

Theatres

Buildings for industrial plants of above-average complexity, such as refineries, chemical plants, food processing plants and breweries

Hospital Buildings

Recreation Buildings

Research Buildings

University and Technical College Buildings with laboratories and research facilities

Airport Terminal Buildings

CALCULATION OF FEE

Cost of Work	Fee
Less than \$100,000	Use Scale 1 — Time Basis
\$ 100,000 — 2,000,000	7.45%
2,000,000 — 4,000,000	7.00
4,000,000 — 6,000,000	6.50
6,000,000 — 8,000,000	6.20
8,000,000 — 10,000,000	6.00
Over 10,000,000 not less than	5.80

BUILDING TABLE 2

APPLICATION

Offices and Administration Buildings

High Schools

Libraries

Grandstands

Convention and Exhibition Buildings

Industrial Plants of medium complexity (other than those outlined in Tables 1 and 4)

Institutional Residences

Jails and Correctional Institutions

Homes for the Aged

Railway and Bus Terminal Buildings

Arenas and Covered Rinks

Hangars

University and Technical College buildings without laboratories or research facilities

CALCULATION OF FEE

Cost of Work	Fee
Less than \$100,000	Use Scale 1 — Time Basis
\$ 100,000 — 2,000,000	6.50%
2,000,000 — 3,000,000	6.00
3,000,000 — 4,000,000	5.50
4,000,000 — 6,000,000	5.00
6,000,000 — 8,000,000	4.70
8,000,000 — 10,000,000	4.50
Over 10,000,000 not less than	4.30

BUILDING TABLE 3

APPLICATION

Primary Schools
Apartment Buildings
Repair and Maintenance Garages
Parking Buildings
Fire and Police Stations

CALCULATION OF FEE

Cost of Work	Fee
Less than \$100,000	Use Scale 1 — Time Basis
\$ 100,000 — 2,000,000	6.00%
2,000,000 — 3,000,000	5.50
3,000,000 — 4,000,000	5.10
4,000,000 — 6,000,000	4.70
6,000,000 — 8,000,000	4.50
8,000,000 — 10,000,000	4.30
Over 10,000,000 not less than	4.20

BUILDING TABLE 4

APPLICATION

Simple Industrial Buildings with large open areas

CALCULATION OF FEE

Cost of Work	Fee
Less than \$100,000	Use Scale 1 — Time Basis
\$ 100,000 — 2,000,000	5.25%
2,000,000 — 3,000,000	5.10
3,000,000 — 4,000,000	4.70
4,000,000 — 6,000,000	4.30
6,000,000 — 8,000,000	4.10
Over 8,000,000 not less than	4.00

BUILDING TABLE 5

APPLICATION

The following is offered as an alternative to Building Tables 1 to 4 inclusive. It is particularly appropriate for projects of above-average complexity in which the cost of engineering services is not directly related to the construction cost.

CALCULATION OF FEE

When the cost of construction is \$100,000 or more, the Engineer shall be reimbursed for the cost of all services of his staff actually engaged on the project, PLUS a percentage fee based on the cost of construction and installation of work covered by the plans and specifications, as follows:

CALCULATION OF COST OF SERVICES

Principals, Executive Engineers,
Department Heads and Senior Specialists

To be negotiated, but in
any case not less than
\$175 per day.

All other design, computer and clerical
staff engaged in the production of
documents; including preparation of
reports and specifications.

Payroll Cost x 1.70

To be based on a normal working day.

— PLUS —

CALCULATION OF PERCENTAGE FEE

Cost of Work	% Fee
Less than \$100,000	Use Scale 1 — Time Basis
\$ 100,000 — 200,000	1.30%
200,000 — 500,000	1.15
500,000 — 1,000,000	1.00
1,000,000 — 2,000,000	0.95
2,000,000 — 4,000,000	0.90
4,000,000 — 6,000,000	0.85
6,000,000 — 10,000,000	0.80
Over 10,000,000	0.75

V.6.2 Remuneration Provisions in the Code of Ethics

The APEO Code of Ethics does not expressly require a consulting engineer to adhere to the minimum scales of fees published by the Association. However, it does contain the following provisions with respect to various aspects of remuneration and adherence to the performance standards published by the APEO:

s.3 A professional engineer shall:

...

(d) not tender on competitive work upon which he may be acting as a professional engineer unless he first advises his employer;

(e) not act as a consulting engineer in respect of any work upon which he may be the contractor unless he first advises his employer; and

(f) not accept compensation, financial or otherwise, for a particular service, from more than one person except with the full knowledge of all interested parties.

s.4 A professional engineer in private practice...shall:

...

(c) carry out his work in full compliance with the appropriate Performance Standards for Professional Practice as may be published from time to time by the Association...

s.5 A professional engineer shall:

...

(d) not attempt to gain advantage over other members of his profession by paying or accepting a commission in securing professional engineering work;

...

(f) give proper credit for engineering work, uphold the principle of adequate compensation for engineering work.

Section 5(f) of the Code of Ethics is the only provision which might indirectly enable the Association to enforce minimum fees for services. This provision (which first came into force in 1967) replaced an earlier provision of the Code which more directly related to the regulation of fees charged. Section 5 of the Code of Ethics enacted

in 1938 provided that "...[the engineer] shall not compete with another engineer for employment on the basis of professional charges by reducing his usual charges and attempting to underbid after being informed of the charge named by the other engineers."

V.6.3 Enforcement of the Fee Schedule and Effect of The Combines Investigation Act

The APEO reports that a number of complaints are made to it each year both from engineers regarding fee cutting by other engineers and from clients regarding "overcharging." At present, the official APEO policy, notwithstanding section 5(f) of the Code of Ethics, is not to involve itself in any manner with the enforcement of its suggested scales of fees. Neither the APEO nor any other body has instituted a formal mechanism to review or regulate the fees charged by a consulting engineer to the client. An engineer may charge as large or as small a fee as he wishes. The APEO, however, does provide a voluntary adjudication service. It will provide to the parties involved standard form memoranda of agreement and a list of adjudicators experienced in such matters. The APEO will not itself adjudicate the fee dispute. It should be noted that adjudication is not used very frequently; it is utilized most often with respect to fairly small amounts which are not worth the expense of litigation.

The APEO did not always take this rather passive approach with respect to fees. Competitive bidding and fee cutting, as we have already seen, were at one time explicitly prohibited by the Code of Ethics. In the past, where clients - usually municipalities - made a practice of calling for bids on a fixed-price basis, the APEO would contact the client and advise that competitive bidding was contrary to the Code of

Ethics and was not in the public interest insofar as it allegedly encouraged engineers to reduce the quality of service - and hence increased the possibility of unsafe design work and building construction. As a matter of policy, the APEO does not continue this practice today.

Fearing that its scale of fees might give rise to a contravention of The Combines Investigation Act, amended in 1976 to include services, the APEO included in its monthly journal, the Ontario Digest, a notice entitled "Notice to the Profession - Combines Investigation Act."

The notice contained the following advice and disclaimer:

The effect of the...[amendments to The Combines Investigation Act] will be that from and after 1 July 1976 it may constitute an offence for members and licencees of the Association to agree upon fees that will be charged for engineering services or to enter into an agreement or arrangement with respect to other competitive matters. The ultimate determination of whether such agreement or arrangement would constitute an offence will depend upon whether such an agreement or arrangement will lessen competition unduly. In this regard it is important to point out that in order to constitute an offence it is not necessary that there be an express agreement. An offence may result from a tacit understanding as between competitors or through the medium of an organization or association that is able to exert pressure on its individual members in order to ensure compliance with any anti-competitive arrangements.

For many years the Association has published a number of fee schedules for General Engineering Projects, Project Management and for Building Projects. The purpose of these schedules is to provide guidance to members and to purchasers of engineering services. The Association considers that such fees represent reasonable remuneration for performance of the services contemplated in the appropriate Performance Standards. However, the fee scales are suggested only and the Association does not consider them to be mandatory. The fee to be charged for engineering services is a matter to be determined by each member and is dependent on the scope of the services to be provided after negotiation with his client. There will be no adverse consequences from the Association if a member charges a fee different from any suggested by the Association.

....

Notwithstanding the actual wording contained in any of the Association's publications they are to be read and interpreted in accordance with the foregoing.
[Emphasis added.]

While The Combines Investigation Act may have the effect of precluding the enforcement of a schedule of fees, the exemption granted by s.32(6) would seem to permit the APEO to enforce its performance standards pursuant to section 4(c) of the Code of Ethics¹³³ insofar as such performance standards can be shown to be "standards of competence and integrity that are reasonably necessary for the protection of the public".¹³⁴

Some members of the consulting engineering profession who have been concerned about "fee cutting" (in particular, the Ontario Structural Engineers Association¹³⁵) have been pressing the APEO to establish minimum "standards of quality" that are more specific than the existing performance standards. The establishment of such standards presumably would make it very difficult for consultants to set fees much below a level that the profession deems "reasonable." The APEO Council, however, has not yet prescribed such minimum standards.

The engineering profession lobbied strenuously against the inclusion of professional services within the purview of The Combines Investigation Act. To that end, the Canadian Council of Professional Engineers presented two briefs, one to the Committee on Finance, Trade and Economic Affairs of the House of Commons, and one to the Minister of Consumer and Corporate Affairs.¹³⁶ The thrust of these submissions is that "the application of a competition policy to professional engineering services will inevitably lead to the practice of awarding commissions primarily on the basis of fees rather than on the basis of qualifications, experience and proven ability; this in turn will inevitably lead to a

general lowering of performance standards. It is to prevent such lowering of standards that the profession has discouraged its members from competing for work on a fee basis."¹³⁷ It is the position of the CCPE that under a competitive approach to engineering services, it would be extremely difficult for provincial regulatory associations to maintain minimum standards of quality control.

V.6.4 Types of Fees

Consulting engineers use several methods in the determination of their fees. The type of fee depends on the kind of project, the scope of services to be performed and the risk of changes in circumstances which might affect the expenses of the engineer. The seven types of fees are listed and described briefly herein:¹³⁸

(i) Per Diem plus out-of-pocket expenses

- used for the following projects:
 - short term
 - intermittent
 - where scope of services difficult to estimate
 - advice, reporting, investigations where minimum amount of design work required
- rate determined by:
 - experience and seniority of engineer
 - length of working day required
 - complexity of service provided
- rate includes:
 - salary
 - overhead costs
 - profit

(ii) Payroll cost multiplied by a factor plus out-of-pocket expenses

- used for the following projects:
 - where scope of work more extensive than in (i)
 - where scope of services not easily determinable because preliminary work not sufficiently complete to determine extent of final design
- multiplication factor determined by
 - overhead expenses
 - contingencies

- risk
 - interest on invested capital
 - profit
 - size of consulting firm
 - type of service performed
 - time required to complete work
 - geographic location of work
 - experience and seniority of staff utilized
- multiplying factor usually between 2.0 - 3.0.
- (iii) Payroll cost multiplied by overhead factor plus fixed fee plus out-of-pocket expenses
- used for the following projects:
 - same as in (ii)
 - project and construction management
 - nature of fixed fee
 - may be lump sum or percentage of estimated or actual construction cost in case of construction management (in which case the percentage varies with the size of the project)
 - incentive feature may be built in tied to an "upset price" for completion of project; if total cost lower than "upset price" fee is increased proportionately; if total cost higher than "upset price" fee is decreased proportionately
 - percentage fee is usually 1% for very large projects and up to 3% for small projects
- (iv) Lump sum payment
- used for the following projects:
 - repetitive work: mapmaking, airborne surveys where a unit price may be determined per map or per plan
 - preliminary reports: feasibility studies environmental studies, especially where no follow-up work is required
 - generally where scope of work can be defined precisely and risk is low
 - lump sum calculated by
 - using one of the other methods enumerated above
 - cost
 - overhead
 - profit
 - risk
 - generally:
 - method most often preferred by clients because the exact cost of engineering services can be determined in advance, thus facilitating clients' budgetary planning

- this method creates highest degree of risk to consultant; therefore the scope of work must be precisely defined in contract and provision made for any additional work.
- (v) Lump sum plus out-of-pocket expenses (disbursements)
 - same as (iv)
- (vi) Percentage of estimated or actual construction costs plus disbursements
 - used for the following projects:
 - design of buildings, highways, bridges, etc.
 - other drawings and specifications
 - preparation of other contract documents needed for describing facilities to be constructed
 - fee calculated by:
 - size of project
 - type of project
 - complexity of design
 - extent of services to be performed
 - percentage for design work alone varies from 3% - 7%
 - percentage for design work and complete supervision of construction varies from 3% - 5%
 - method not used as extensively as in past:
 - due to extensive mechanization of construction operation, costs of many engineering activities have increased greater than costs of construction; in addition, significantly more man-hours are required to perform competent engineering services than in the past
 - there is always a time-lag between the performance of engineering services and the start of construction; the effect of inflation on the cost of construction during this interval increases the cost of engineering services to the client
 - The Anti-Inflation Board ruling that consultants must charge 1% less than their normal fee every quarter has made the percentage method less attractive to consultants
- (vii) Combination of methods
 - In many large projects the client will insist upon combining various methods of payment. Thus the preliminary work (e.g. feasibility studies, preliminary design work) may be calculated on a per diem or cost-plus basis while the preparation of specifications and plans may be calculated on a percentage basis.

The following chart illustrates the relationship between the type of fee charged and the type of engineering services to be performed.¹³⁹

TABLE V.6: RELATIONSHIP BETWEEN TYPE OF FEE AND TYPE OF ENGINEERING SERVICE

Type of Fee	Type of Project						
	P1	P2	P3	P4	P5	P6	P7
C1	X	X	X		X	X	X
C2	X	X	X		X	X	X
C3	X	X	X	X			
C4					X		X
C5					X		X
C6		X	X	X			

Type of Fee

The types of compensation vary according to preference and to the type of project or services to be rendered. The most usual methods of remuneration can be identified as follows:

- C.1 Per diem, plus out-of-pocket expenses.
- C.2 Payroll cost multiplied by a factor, plus out-of-pocket expenses.
- C.3 Payroll cost multiplied by an overhead factor, plus fee, plus out-of-pocket expenses.
- C.4 Unit or global lump sum.
- C.5 Unit or global lump sum, plus out-of-pocket expenses.
- C.6 Services at percentage of cost of construction project, plus out-of-pocket expenses.
- C.7 A combination of these methods.

Type of Engineering Service

- P.1 Economic, transportation, regional development, industrial engineering or other pre-feasibility or feasibility studies involving environmental impact assessment.
- P.2 Preliminary and detailed engineering studies and preparation of plans and specifications.
- P.3 Supervision of actual construction work.
- P.4 Project and construction management.
- P.5 Airborne and miscellaneous other surveys and exploration, and report.
- P.6 Advisory services.
- P.7 Short assessment study and preparation of terms of reference.

V.6.5 Adherence to the Fee Schedule

(a) Choosing the Consulting Engineer

The usual method used by a client for choosing a consulting engineer is to ask several consulting firms to submit a "proposal" for the job. The proposal usually contains the following information:

- an outline of work programme;
- the staff to be used;
- time schedule; and
- related experience of the firm.

An estimate of the fee is usually not included in the proposal. The traditional method of selection of the consultant involves the ranking of the proposals in order of qualifications. The consultant is usually not initially chosen on the basis of fee. Once the consultant is chosen, the fee is negotiated. If the parties cannot agree on an appropriate fee the client will then begin negotiations with the consultant ranked next on the list. Notwithstanding the opposition of the ACEC, CEO, CCPE and other engineering associations to competitive bidding, many clients in recent years have been insisting upon receiving an estimate of the cost of engineering services to be performed.

Thus, consultants may be ranked according to qualifications and price of services. The extent to which clients utilize this form of selection is very difficult to gauge. While most provincial government ministries do not offer jobs on this basis, some regional municipalities and many clients in the private sector do. Once the scale of fees is drawn up by the APEO, that body does not negotiate with clients to accept the schedule. This function is performed at the provincial level by the Consulting Engineers of Ontario, and at the federal level by the

Association of Consulting Engineers of Canada. Thus the CEO has an Intergovernmental Committee with four subcommittees which meet with the Ministry of Transportation and Communications, the Ministry of the Environment, the Ministry of Government Services and the Ministry of Natural Resources. Similarly, the ACEC has a standing committee known as the Committee on General Conditions and Fees for Federal Work which has contact with the Treasury Board, the Department of Public Works and other federal government ministries. To date, the ACEC and the CEO have been fairly successful in persuading the various ministries to respect provincial fee schedules in project negotiations. Most government ministries have fairly formalized procedures for the selection of consulting engineers.

Some consultants have raised several objections with respect to the selection of consultants by public sector clients. They argue that the procedures are not standardized and objective. The existence of so-called "short lists" - in which are listed the names of four or five consultants that are approached for most governmental work - is cited as an example of an informal selection procedure that may not serve the public interest. Consultants who have not done very much work for government and who do not have extensive connections with politicians and civil servants may find it difficult to obtain government contracts. In some instances - and this particularly obtains with respect to departments of regional municipalities - the work is almost always awarded to the same consultant who has had a very close relationship with the government department head extending over a long period of time.

(b) Competitive Bidding

As we have already seen, there is at present no formal regulatory sanction against competitive bidding and fee cutting. However, there are several pressures in the profession tending to discourage the practice. First, there is the generalized feeling that it is somehow "unprofessional" to engage in competitive bidding. Second, this professional ethic is reinforced by the activities of some of the voluntary associations to which consulting engineers belong. As we have already seen, the ACEC and the CEO negotiate with government bodies to accept the provincial fee schedules. The Consulting Practice Manual of the ACEC contains the following admonition:

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It should be made clear that this Association strongly promotes the use, by consulting firms and clients, of provincial fee guidelines or schedules, and provincial agreement forms.

These schedules and agreements were established by the body in each Province charged with the administration of the Province's Professional Engineers' Act, and therefore were created in the public interest to ensure optimum benefits in service and operation to client and consultant alike.

As we have seen, the Ontario Structural Engineers Association was established for the primary purpose of seeking informally to prevent fee cutting.

The existence of fee cutting amongst consultants is manifested in several ways:

(1) Many firms with large staff and high overhead, especially during periods of recession, may be willing to decrease their profit margin on a particular job in order to avoid lay offs of key staff and pay overhead costs. In some cases this may involve reducing the rate below that recommended by the fee schedule. On the other hand, many firms -

especially the larger consultants - are very reluctant not to follow the fee schedule and in the name of the principle of "maintaining the integrity of the fee schedule" will deliberately underestimate the number of hours required to perform the services or, in very few cases, will assign less "expensive" personnel to the job. Consultants who follow this practice maintain that the quality of services performed is not decreased by using this method since the client is charged only for the amount of time specified in the contract. If additional time is required it is at the expense of the consultant.

(2) Many engineers who work as salaried employees provide consulting services in their spare time. Such "moonlighters" in some cases are able to provide some engineering services at a lower cost than many large consulting firms because of their greatly lower overhead expenses. (It should be recalled that any member of the APEO may provide professional engineering services without being designated a consulting specialist. The regulations with respect to the designation of consultants merely prohibit non-designated persons from taking and using the term "Consulting Engineer."¹⁴¹ The Code of Ethics - especially sections 3(d), 3(e) and 4(b) - regulate some aspects of the manner in which an employee-engineer may contract to perform engineering services for persons other than his employer.)

(3) Fee cutting occurs in the structural design of apartment buildings. Because the design of such buildings is often on a "mass production" basis some consultants are able to charge considerably less than the amount recommended in the Scale of fees.

V.6.6 Remuneration of Salaried Engineers

As we have already noted, the APEO does not act as a bargaining

agent for salaried engineers. However, the Association does publish annually a salary survey which may be used by employee engineers in negotiating salaries with their employers. The APEO also publishes a "Classification Guide of Engineering Responsibility Levels" which lists six levels of responsibility, describes the type of duties performed in each, and gives an indication of the salary spread of each classification.

V.6.7 Fee Splitting and Referrals

The extent to which fee splitting and receiving a commission for a referral occurs in practice is difficult to assess. The practice undoubtedly does occur. The only provision of the Code of Ethics prohibiting the practice is section 5(d) which provides that "[A] professional engineer shall...not attempt to gain advantage over other members of his profession by paying or accepting a commission in securing professional engineering work."

V.6.8 Special Means of Collection

In addition to his ordinary remedies by means of a civil cause of action, the engineer or architect may be able to enforce a debt owing to him by the owner by enforcing his right to a mechanics' lien pursuant to the Mechanics' Lien Act, R.S.O. 1970, c.267: Read v. Whitney (1919), 45 O.L.R. 377 (C.A.); Burgess v. Khoury (Albrechsten's Claim), [1948] O.W.N. 789. The engineer or architect may be entitled to the mechanic's lien with respect to plans prepared by him if he supervises the actual construction; he may not be entitled to the lien in cases where he does not supervise the construction or where no construction takes place.¹⁴²

V.7. Professional Liability and Insurance

V.7.1 Types of Liability

(a) Criminal Liability

If a professional engineer is negligent in the design or supervision of the construction of a building or other work he may be subject to criminal sanction. Section 202(1) of the Criminal Code¹⁴³ provides that:

everyone is criminally negligent who

- (a) in doing anything, or
 - (b) in omitting to do anything that it is his duty to do,
- shows wanton or reckless disregard for the lives or safety of other persons.

Section 203 provides that every person who causes the death of another person by criminal negligence is guilty of an indictable offence and is liable to imprisonment for life. It should be noted that while an engineer may be open to criminal liability for his negligent acts or omissions, there is no reported case in Canadian jurisprudence of an engineer being convicted of criminal negligence.

(b) Liability in Contract

The general law of contract obtains with respect to the contractual liability of professional engineers.¹⁴⁴ It should be noted that as a general principle of contract law, the engineer is not liable in contract to third parties; he may be held liable only to persons with whom he has privity of contract. Some of the more common areas of contractual liability with respect to the performance of engineering services are as follows:

- (i) express contractual warranties or guarantees¹⁴⁵ ;
- (ii) roof claims¹⁴⁶ (i.e. claims arising out of the design or construction supervision of roofs);

(iii) delegation of supervision to other consultants¹⁴⁷; and

(iv) substitution for specified materials of other materials¹⁴⁸.

(c) Civil Liability in Negligence: Liability to Third Parties

(i) The Building Code

Pursuant to The Building Code Act, S.O. 1974, c.74, the Lieutenant Governor in Council promulgated the Ontario Building Code, O.R. Reg. 925/75. The Building Code imposes a duty upon professional engineers and architects who have designed a building to carry out the field review of the building during the course of construction. The following provisions of the Building Code are relevant with respect to this issue:¹⁴⁹

2.3.1 The following buildings shall be designed by an architect or professional engineer or a combination of both:

- (a) A building used or intended for assembly occupancy or institutional occupancy.
- (b) A building exceeding 6,000 square feet in building area or 3 storeys in building height used or intended for residential occupancy, business and personal services occupancy, mercantile occupancy or industrial occupancy.

2.3.2 Where the foundations of a building are to be constructed below the level of the footings of adjacent buildings and within the angle of repose of the soil, as drawn from the bottom of such footings, the foundations shall be designed by an architect or professional engineer or a combination of both.

2.4 Where a building has been designed by an architect or professional engineer, or both in accordance with subsection 2.3.1, the architect or professional engineer or both shall be responsible for the field review of the building during the course of construction to ensure conformance to the design.

Engineers have expressed concern about the extent to which these provisions impose civil liability in tort for supervisory work for which they may not be contractually liable. In many instances the consultant who performs

the structural design services for a building may not be contractually responsible for the supervision of the construction. Thus both consultants (namely the consultant performing the structural design and the consultant contractually responsible for supervision) may be liable in negligence for a building which is not constructed in conformity with the design.

(ii) Liability as prime consultant for the negligence of sub-consultant specialists.¹⁵⁰

(iii) While an engineering firm itself may be vicariously liable for the negligence of its employees, an employee-engineer in some circumstances may be personally liable for his negligent acts.

(iv) Liability for negligent misrepresentation causing economic loss.¹⁵¹

(v) Failure to comply with municipal by-laws or zoning regulations.¹⁵²

(vi) Negligent supervision and inspection.¹⁵³

(vii) Liability for the use of prefabricated products.¹⁵⁴

(viii) Liability for the certification of the amount payable to the contractor under a building contract.¹⁵⁵

(d) Limitations of Actions

Section 28 of The Professional Engineers Act provides as follows:

(1) Except as provided in subsection 2, an action against a member or a licensee for negligence or malpractice in connection with professional services requested of him or rendered by him or under his direction or control shall be commenced within and not later than twelve months after the cause of action arose.

(a) The court in which an action mentioned in subsection (1) has been or may be brought may extend the period of limitation specified therein either before or after it has expired if the court is satisfied that to do so is just.

(3) This section does not apply to proceedings under section 25." [Section 25 deals with disciplinary proceedings]

V.7.2 Limiting Liability by Contract

While an engineer may not limit his liability in negligence towards third parties, he may limit his contractual liability to his client. To that end, the National Programme Administrator of the Professional Liability Insurance Programme recommends the following with respect to the limitation of the engineer's contractual liability to the owner: ¹⁵⁶

Suggested Clauses for Consultants for Limiting Liability.

It is suggested that consultants limit their liability on the basis of one or more of the following five recommendations:

- (1) Liability limited to the value of the consultant's fee for services rendered;
- (2) Liability limited to a percentage of the fee charged for services rendered;
- (3) Liability limited to a percentage of the construction cost of the work;
- (4) Liability limited to the amount of errors and omissions insurance coverage effected at the time the contract entered;
- (5) Limit damages to direct damage thereby excluding consequential loss.

V.7.3 Professional Liability Insurance

(a) Introduction

The APEO does not require its members to carry any sort of liability insurance. While no concrete data exists with respect to the extent to which engineers do carry liability insurance, it is estimated that at least 75% of engineers in private practice do carry such coverage. Many clients, especially in the public sector, require engineers to carry a stipulated amount of professional liability insurance as a condition of undertaking projects.

(b) History of Liability Insurance Coverage

During the late 1960's, the major underwriter of professional liability insurance in Canada decided to discontinue this service to engineers because it was becoming increasingly unprofitable to do so. In order to fill this hiatus the Canadian Council of Professional Engineers and the Association of Consulting Engineers of Canada established a Joint Insurance Committee to investigate alternative insurance markets. In that year the Committee established the Canadian Engineers Professional Liability Insurance Programme sponsored by the ACEC and the CCPE, underwritten by the Simcoe and Erie General Insurance Company of Hamilton, Ontario, and administered by Farquhar Bethune Insurance Limited, Ottawa. Of those consultants who do carry professional liability insurance, about 75% are insured under this programme while the remaining consultants are insured by other companies. The Joint Insurance Committee of the ACEC has several functions:

- (1) it liaises with the programme administrator with respect to the general administration of the plan;
- (2) it reviews grievances of an insured engineer; and
- (3) it receives a detailed yearly report with respect to the status of the programme and reviews changes in the programme with respect to underwriting, rating and other aspects thereof.

(c) The National Insurance Programme

(i) Types of Policies

The National Insurance Programme consists of two separate and distinct kinds of policies: one policy for consulting engineering firms,

and another policy for individual engineers in their personal capacities.

(ii) The Extent of Coverage

The following is a summary of the extent of coverage in the policy of the Canadian Engineers Professional Liability Insurance Programme:

1. Broad Coverage

Covers the insured's liability for errors, omissions and negligent acts arising out of the performance for others of professional services as engineers or architects.

2. Retroactive Coverage

Provides coverage for errors, omissions and negligent acts discovered during the policy period even though they occurred in years past.

3. Broad Definition of Insured

The policy insures not only the named insured, but present and former partners, officers, directors, stockholders or employees of the insured firm while acting within the scope of their duties.

4. Legal Defense

Provides legal defense including investigations, lawsuits and arbitrations and pays all costs. The legal defense costs are not subject to the deductible.

5. Limits of Liability

The basic policy is for limits of \$250,000 and can be increased up to \$5,000,000 or higher on special request. For small firms a limit of liability of \$100,000 is available.

6. Deductible

The minimum deductible is \$5,000 but higher deductibles are offered at substantial premium reductions.

7. Eligibility

Only members in good standing of the constituent provincial associations of the CCPE and/or members in good standing of ACEC are eligible for enrolment. They must have at least five years of experience since graduation.

Each application will be carefully examined for eligibility. While every effort will be made to accept a very high percentage of applications, it is vital to the interests of the majority of competent and responsible firms, to screen the applications of those whose history and experience indicate an undesirable degree of risk.

Where applicants appear to be marginal in terms of risk, a more thorough investigation might reveal extenuating circumstances, or in some cases, might indicate corrective steps to overcome the unacceptable features of the operation.

In all cases, acceptance and rating will be on individual merit and the interests of the group will not be subordinated to accommodate an individual.

8. Aggregate Limit

An aggregate limit of twice the limit of liability up to \$750,000, decreasing for higher limits. With this feature, coverage is still in force to the second limit of the policy if one claim early in the policy period threatens to exhaust the claim limit of the policy.

The policy does not cover the following five broad areas of activity:

1. Business risk.
2. Unreasonable assumed risk.
3. General areas of specialized work (endorsed for those who demonstrate competence in such specialty).
4. Activities outside the professional knowledge of architects and engineers.
5. Risks covered by other classes of insurance.¹⁵⁷

(iii) The History of Insurance Claims and Rates

1. The Source of Claims

The National Programme Administrator of the Professional Liability Insurance Programme provided the following information with respect to net premiums, incurred losses and type of claim by engineering discipline:

ENGINEERS' PROGRAM

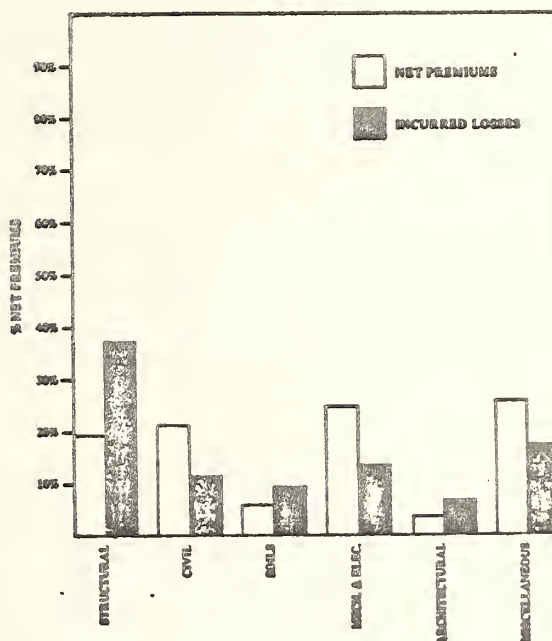
Our analysis of statistical results under the Engineers' Program is a comparison of net premiums to incurred losses as derived under each of six categories of disciplines. Figure 2 is a bar chart illustration of these results and again it consists of a comparison of net or "pure" premiums

to incurred losses. Again, on this basis, the break-even point is reached when losses are equal to net premiums.

Since Loss Control Bulletin No. 23 was distributed, there has been no change in that the same three disciplines of structural engineering, soil mechanics and architectural activities are the cause of more concern than the other disciplines. During the last year, we have witnessed a further deterioration of the claims experience for structural engineering.

Structural engineering is also the only discipline where more than 75% of the claims involve alleged errors in design. In the case of all the other disciplines, the great majority of claims are the result of allegations of negligent field services (usually described by the claimant as negligent supervision or inspection of the works).

FIGURE 2 (ENCL.)



Roof Collapse

Some 40% of the claims in the area of structural engineering are the result of either partial or total roof collapses. Many such collapses are due to snow loads and no province of Canada has shown immunity to this kind of problem. In most instances, we find that the designer had indeed met the standards of the National Building Code. The Code however, is strictly a basic standard for normal conditions and our Courts may, and will, hold that additional design precautions become necessary under unusual circumstances. For example, if a particular low roof section is subject to excessive snow-drift from an adjacent higher roof structure, it is evident that snow will pile up on the lower roof at an unusual rate. No matter how maintenance-conscious the owner is, this roof structure will be subjected to unusual pressures, and this should be allowed for in the consultant's design.

With the downfall of the doctrine of privity of contract, the consultant will also be liable towards subsequent buyers of the property who were not a party to arrangements for special maintenance programmes accepted by the original owner as a hedge against a minimal design. In short, the National Building Code caters to normal snow load conditions and unusual conditions due to building orientation, design of the building itself, surrounding topography, winds or other such factors should be taken into consideration and the design criteria should be increased no matter what the Building Code says.

Consultants should note that it is no defence in case of a claim for professional negligence to have met the National Building Code. The Courts will probably hold that the consultant should have known that the conditions of a particular project were different, and that he should have provided to meet them in his design.

Soil Mechanics

Soil mechanics will remain a problem which will undoubtedly get worse if engineers who practise in this discipline continue to accept the new modus operandi which is being imposed upon them. In the past, assignments were negotiated by soil consultants with the design consultant or the owner on the basis of the soil consultant's opinion as to the extent of investigation required and the invoice was eventually based on actual time expended to complete the necessary work. Today, soil consultants are often required to provide quotations for various assignments in competition with other firms. Commissions are being awarded on the basis of lowest estimated costs and frequently the successful bidder gets the job because he has offered to do less field

work. The problem is that the client may not know the ramifications of such corner-cutting, and the Courts may well hold that, as the expert in this discipline, the soil consultant had an obligation to advise his client that what was being asked of him might not provide satisfactory results. In other words, if the soil consultant accepts to go along with what he is being asked to do, he is tacitly agreeing that he can produce a good result from that limited amount of investigation.

Conclusion

The problem areas have been identified. They are, more than anything else, a reflection of the fact that our Courts are rapidly moving from the doctrine of reasonable care to the doctrine of strict liability of all professionals. The success and long term viability of the Program is dependent upon all consultants recognizing this situation and upon continued efforts in the area of loss prevention.

We know that there is a drastic increase in the number of allegations of negligent field services. We know that most forms of unqualified certificates are almost regarded as promissory notes by our Courts. The field services actually provided by the consultant must therefore be a true reflection of their contractual obligations and all certificates signed by consultants must be qualified so as to apply only to the phases of the project which were completed under the consultant's supervision.

The office of the National Program Administrator will distribute further communications on the subject of field services and on the urgent need to revise the standard Owner/Consultant agreement, so that contracts reflect the liability being imposed on the consultant in the areas of faulty workmanship and faulty materials.

Discipline	Design Error		Inadequate Supervision		Workmanship		Miscellaneous		Totals	
	I	\$	I	\$	I	\$	I	\$	I	\$
* Architectural (Architectural excl. roofs)	18.3	31.1	13.0	15.9	4.2	0.5	7.5	4.8	43.0	52.3
	(13.7)	(26.8)	(9.9)	(12.1)	(3.1)	(0.4)	(4.6)	(4.1)	(31.3)	(43.3)
* Structural (Structural excl. roofs)	10.4	20.8	5.2	7.2	2.4	0.8	6.5	6.6	24.5	35.4
	(5.7)	(10.2)	(3.6)	(4.5)	(1.3)	(0.6)	(3.6)	(3.0)	(14.2)	(18.3)
(Roof Problems)	(9.3)	(14.8)	(4.7)	(5.5)	(2.1)	(0.5)	(6.0)	(5.0)	(22.1)	(25.8)
* Soils	1.1	0.4	0.6	2.5	0.4	0.2	0.5	0.0	2.6	3.0
* Mechanical	4.2	1.2	2.7	0.8	0.8	0.2	2.9	0.8	10.6	3.0
* Other Engineering	1.2	0.2	6.7	3.4	0.4	N/A	11.0	2.7	19.3	6.3
	35.2	53.7	28.2	28.9	8.2	1.7	28.4	14.8	100.0	100.0

I = % of claims incidence
\$ = % of total claims cost

To December 31, 1975

2. History of Rate Increases

It is clear that there has been a fairly substantial increase in malpractice claims during the last few years. For example, in 1970 there was an incidence of one claim for every ten policies in force. By the end of 1975 this had increased to one claim for every 4.8 policies in force. The following table illustrates the net increase of premiums from the years 1970 to 1976.

TABLE V.7

Net Increase in Insurance Premiums (1970-1976)

<u>Year</u>	<u>Premium</u>
1970	\$100
1975	\$111
1976	\$155.40

Five factors are often mentioned to explain the fairly significant increase in premium costs during the last few years:

1. Inflation
2. Increased number of claims
3. Higher awards by the courts
4. Consultants undertaking contractual responsibilities which,

as a matter of good business practice, they ought not to undertake.

For example, many clients - especially public sector clients - have required consultants to guarantee contractually the cost of projects.

Thus, the contract may provide that the consultant must indemnify the client for any excess in actual construction cost greater than ten per cent of the estimated construction cost. Some consultants feel that such a provision is unreasonable, given the fact that construction often takes place many months - and sometimes even a year - after the completion

of the design drawings.

5. Consultants are being held liable for faulty construction that does not conform to the design specifications. The provisions of The Ontario Building Code which impose a duty upon the engineer who designs a building to also carry out field review are partly responsible for this increased liability. Another factor is the fact that many clients do not wish to pay for the full cost of field review and therefore do not provide for such review in the contract with the consulting design engineer. If at a later date the consultant is called in by the client to supervise a limited part of the construction, he may be found legally responsible for the non-conformance of the construction to the design with respect to the whole building, unless he specifies otherwise at the time he is called in.

(iv) The Loss Control Programme

In an attempt to prevent further increases in premium rates, the National Programme Administrator has developed a very comprehensive loss control programme designed to educate the engineer with respect to various aspects of professional liability. This programme consists of the following activities:

1. Bi-monthly Loss Control Bulletins are published and distributed to insured engineers.
2. Loss control seminars are conducted throughout the country each year.
3. In-house seminars are held for the benefit of larger firms.
4. Legal advice with respect to contractual clauses that affect the engineer's liability is provided prior to the signing of the contract with the client.

5. A task force has been working for the past one and one-half years preparing standard form owner/consultant agreements for use across Canada.

(v) Issues of Concern to the Insurer

1. The increasing scope of professional liability.

2. The insurers are concerned that the profession does not adequately recognize the difference between employed engineers and consulting engineers who are engaged in the business of offering engineering services to the public. There are many instances of engineers offering consulting services without the proper business and professional training. For example, the National Programme Administrator suggested to the Deans of Engineering that there ought to be training at the university level in professional responsibility and business administration. To date, however, the universities have not incorporated these types of training into their educational system.

3. Engineers sometimes "approve" shop drawings without spending an adequate time to do so properly. The National Programme Administrator suggests that design contracts require drawings to be merely "reviewed" and not "approved."

4. The National Programme Administrator is also concerned that engineers are increasingly undertaking projects where there is a definite conflicting business interest involved. For example, engineers should not be "developers" of projects for which they are also providing engineering services. In one recent case, a building was designed by an architect and an engineer who were members of the Board of Directors of the development company. When a fault was found in the design of the sprinkler system, the Board of Directors was faced with the necessity of

making a decision as to whether or not to sue the architect and engineer who designed the system and were at the same time members of the Board of Directors.

V.7.4 Bibliography

The following publications may be helpful with respect to the professional liability of engineers:

Hudson, Building and Engineering Contracts, 10th Edition, Sweet and Maxwell, London, 1970.

Johnson, The Joint and Several Responsibility of Architects, Engineers and Builders, Wilson et LaFleur, Montreal, 1955.

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Simpson, Law for Engineers and Architects, 4th Edition, West Publishing Company, St. Paul, 1958.

Wait, Engineering and Architectural Jurisprudence, J. Wylie & Sons, New York, 1898.

Walker and Rohdenburg, Legal Pitfalls in Architecture, Engineering and Building Construction, McGraw-Hill, New York, 1968.

VI. THE DISCIPLINE OF PROFESSIONAL ENGINEERS

VI.1 The Powers of Council

VI.1.1 When Invoked

The authority of the Council of the APEO to discipline its members, licensees and holders of certificates of authorization may be invoked in only two circumstances:

- (a) a finding that the member is guilty of "professional misconduct"; and
 - (b) a finding that the member has obtained registration by reason of misrepresentation.¹⁵⁸
- The meaning of "professional misconduct" will be discussed more fully below.

VI.1.2 Formal Sanctions

The Professional Engineers Act empowers the Council to impose a very broad range of sanctions:

25.-(1) Subject to subsection 2, where the council finds that a person who is a member or licensee is guilty of professional misconduct or has obtained registration as a member or has been issued a licence by reason of misrepresentation by such person, the council may by order do one or more of the following.

1. Reprimand such person and, if considered proper, direct that the fact of the reprimand be recorded on the register.
2. Suspend the membership or licence of such person for such time as the council considers proper and direct that the reinstatement of such membership or licence on the termination of such suspension be subject to such conditions, if any, as the council considers proper.
3. Direct that the imposition of any penalty be suspended or postponed for such period and upon such terms as the council considers proper and that at the end of such period and upon the compliance with such terms any penalty be remitted.
4. Direct that the membership or licence of such person be cancelled and that the name of such person be removed from the register.
5. Direct that the decision of the council be published in detail or in summary in the official journal of the Association or in such other manner or medium as the council considers appropriate in any particular case.
6. Direct that, where it appears that the proceedings were unwarranted, such costs as to the council seem just be paid by the Association to the member or licensee whose conduct was the subject of such proceedings.

One additional sanction is available: designation as a specialist or consultant may be revoked if the engineer has been found guilty of "professional misconduct." (The Professional Engineers Act, s. 7(1)(g), O.R. 59/73, s.8 and O.R. 60/73, s.8.).

VI.2 Professional Misconduct

VI.2.1 Definition

The Professional Engineers Act empowers the Council to define "professional misconduct" for the purposes of the Act.¹⁵⁹ Pursuant to this power, Council passed the following regulations:¹⁶⁰

8. For the purposes of the Act and the regulations, "professional misconduct" means,

- (a) gross negligence;
- (b) infamous, disgraceful or improper conduct in a professional respect, including any violation of the code of ethics prepared and published by the council pursuant to section 9 of the Act;
- (c) incompetence;
- (d) conviction of a serious criminal offence by a court of competent jurisdiction;
- (e) continued breach of the regulations or by-laws of the Association.

9. For the purposes of section 8,

- (a) "gross negligence" means any act or omission in the carrying out of work of a professional engineer that shows a reckless or deliberate disregard of or indifference to the rights or safety of others;
- (b) "incompetence" means lack of adequate knowledge of, or continued neglect or failure to exercise, the ordinary skills of a professional engineer;
- (c) "serious criminal offence" means
 - (i) any act committed in Canada that is punishable on indictment under the Criminal Code (Canada), and
 - (ii) any act that if committed in Canada would be punishable on indictment under the Criminal Code (Canada),

but does not include any political offence committed outside Canada or any offence that does not affect the fitness of a professional engineer to practice his profession.

A specific provision was enacted with respect to the use of specialty designations:¹⁶¹

8. Only a member who has been designated as such by the council may take and use the term, title or designation denoting his qualification as a specialist in a field of engineering; use of any term, title or designation that will lead to the belief that he has been designated as a specialist by a member not so designated will constitute improper conduct in a professional respect under the definition of "professional misconduct" in the regulations.

An identical provision was enacted with respect to the use of the title "Consulting Engineer."¹⁶²

In a practical sense it is important to distinguish between the first three components of "professional misconduct." "Gross negligence" is an act or omission in the carrying out of work that at least would give rise to a civil cause of action in negligence. "Infamous, disgraceful or improper conduct in a professional respect" does not necessarily refer to standards by which the quality of work is to be judged, but rather usually refers to the moral and ethical aspects of professional behaviour as defined in the Code of Ethics. "Incompetence" refers to the knowledge and skills possessed by the professional. Thus, an engineer may be found guilty of "gross negligence" but not "incompetence" if he knew how to carry out the work properly but in fact did not take the time to ensure adequately the safety of the finished product. Similarly, an engineer in some circumstances may be found guilty of "incompetence" but not "gross negligence." On the other hand, a person may be found liable for civil negligence (not amounting to gross negligence) and may not be guilty of "professional misconduct" unless he is found to be "incompetent."

VI.2.2 The Code of Ethics

VI.2.2(a) Statutory Authority

Section 9 of The Professional Engineers Act requires the Council

of the APEO to prepare a code of ethics. It provides that:

(1) The council shall prepare and publish from time to time a code of ethics containing standards of conduct designed for the protection of the public, which standards members of the profession and licensees must subscribe to and follow in the practice of professional engineering.

(2) Copies of the code of ethics shall be sent to the members and licensees and shall be available free of charge to members of the public who apply therefor.

VI.2.2(b) History

The history of the APEO Code of Ethics is a long one. Even prior to the enactment of legislation in 1937 giving the APEO complete regulatory power to control the practice of engineering in Ontario, the Association had prepared a code of ethics to which its members were expected to adhere. However, it was not until amendments in 1947¹⁶³ that the Association had the statutory authority to establish a formal Code of ethics and to define "unprofessional conduct."

VI.2.2(c) Contents of the Present-Day Code of Ethics

The Code of Ethics basically is a document which delineates the moral ethical and professional duties of the professional engineer to the public, to his employer, to his client, to other professional engineers and to himself. The following sets out the Code of Ethics presently obtaining:

Code of Ethics

General

1. A professional engineer owes certain duties to the public, to his employers, to his clients, to other members of his profession, and to himself, and shall act at all times with:
 - (a) fairness and loyalty to his associates, employers, clients, subordinates and employees;
 - (b) fidelity to public needs; and
 - (c) devotion to high ideals of personal honour and professional integrity.

Duty of Professional Engineer to the Public

2. A professional engineer shall:

- (a) regard his duty to public welfare as paramount;
- (b) endeavour at all times to enhance the public regard for his profession by extending the public knowledge thereof and discouraging untrue, unfair or exaggerated statements with respect to professional engineering;
- (c) not give opinions or make statements on professional engineering projects of public interest that are inspired or paid for by private interests unless he clearly discloses on whose behalf he is giving the opinions or making the statements;
- (d) not express publicly, or while he is serving as a witness before a court, commission or other tribunal, opinions on professional engineering matters that are not founded on adequate knowledge and honest conviction;
- (e) make effective provisions for the safety of life and health of a person who may be affected by the work for which he is responsible; and at all times shall act to correct or report any situation which he feels may endanger the safety or the welfare of the public.
- (f) make effective provision for meeting lawful standards, rules, or regulations relating to environmental control and protection, in connection with any work being undertaken by him or under his responsibility; and
- (g) sign or seal only those plans, specifications and reports actually made by him or under his personal supervision and direction.

Duty of Professional Engineer to Employer

3. A professional engineer shall:

- (a) act in professional engineering matters for each employer as a faithful agent or trustee and shall regard as confidential any information obtained by him as to the business affairs, technical methods or processes of an employer and avoid or disclose any conflict of interest which might influence his actions or judgement;
- (b) present clearly to his employers the consequences to be expected from any deviations proposed in the work if his professional engineering judgement is overruled by non-technical authority in cases where he is responsible for the technical adequacy of professional engineering work;

- (c) have no interest, direct or indirect, in any materials, supplies or equipment used by his employer or in any persons or firms receiving contracts from his employer unless he informs his employer in advance of the nature of the interest;
- (d) not tender on competitive work upon which he may be acting as a professional engineer unless he first advises his employer;
- (e) not act as consulting engineer in respect of any work upon which he may be the contractor unless he first advises his employer; and
- (f) not accept compensation, financial or otherwise, for a particular service, from more than one person except with the full knowledge of all interested parties.

Duty of Professional Engineer in Independent Practice to Client

4. A professional engineer in private practice, in addition to all other sections, shall:

- (a) disclose immediately any interest, direct or indirect, which might in any way be construed as prejudicial to his professional judgement in rendering service to his client;
- (b) if he is an employee-engineer and is contracting in his own name to perform professional engineering work for other than his employer, provide his client with a written statement of the nature of his status as an employee and the attendant limitations on his services to the client. In addition he shall satisfy himself that such work will not conflict with his duty to his employer;
- (c) carry out his work in accordance with applicable statutes, regulations, standards, codes and by-laws; and
- (d) cooperate as necessary in working with such other professionals as may be engaged on a project.

Duty of Professional Engineer to Other Professional Engineers

5. A professional engineer shall:

- (a) conduct himself towards other professional engineers with courtesy and good faith;
- (b) not accept any engagement to review the work of another professional engineer for the same employer, except with the knowledge of that engineer, or except where the connection of that engineer with the work has been terminated;
- (c) not maliciously injure the reputation or business of another professional engineer;

- (d) not attempt to gain an advantage over other members of his profession by paying or accepting a commission in securing professional engineering work;
- (e) not advertise in a misleading manner or in a manner injurious to the dignity of his profession, but shall seek to advertise by establishing a well-merited reputation for personal capability; and
- (f) give proper credit for engineering work, uphold the principle of adequate compensation for engineering work, provide opportunity for professional development and advancement of his associates and subordinates; and extend the effectiveness of the profession through the interchange of engineering information and experience.

Duty of Professional Engineer to Himself

6. A professional engineer shall:

- (a) maintain the honour and integrity of his profession and without fear or favour expose before the proper tribunals unprofessional or dishonest conduct by any other members of the profession; and
- (b) undertake only such work as he is competent to perform by virtue of his training and experience, and shall, where advisable, retain and cooperate with other professional engineers or specialists.

At present, the APEO does not have a manual to guide the engineer in the application of the code to practical situations. If an engineer, or a member of the public, is doubtful as to the correct professional behaviour in a given situation he may consult the Director of Legal and Professional Affairs for an opinion. The only formal information published in this regard is a short pamphlet entitled "Practice and Ethics: A Casebook," compiled by the Practice and Ethics Committee of the APEO Council. The staff of the APEO sometimes give lectures at the universities on the subject of professional ethics and practice.

VI.3 The Process of Discipline: Herein of Formal and Informal Procedures

VI.3.1 Introduction

This section of the paper will briefly outline the subsisting disciplinary process. It will not, however, seek to analyse and evaluate it to any great extent.

The disciplinary process of the APEO basically entails three distinct steps: (i) review by APEO staff; (ii) informal investigation by the Practice and Ethics Committee; (iii) formal disciplinary hearings by the Discipline Committee of Council. These three steps have been listed in ascending order reflecting the seriousness of the conduct under investigation and the degree of formality. It should be noted that a complaint may be made by any one of the following groups of persons:

- (i) a member of the public;
- (ii) a client of an engineer;
- (iii) a fellow engineer; or
- (iv) a member of the APEO staff.

In addition, complaints may be initiated at any of the three stages of the process.

VI.3.2 Review by APEO Staff

This first stage is the most informal of the three. Most external complaints begin at this stage. The complaint is informally assessed by the Director of Legal and Professional Affairs and his staff. They assess the nature of the complaint, the severity of the offence charged, the objective of the complainant and the obligation of the Association to further investigate the complaint.

In the great majority of cases, the staff will attempt to reconcile

the differences of the parties through encouraging discussion between the parties in order to reach an acceptable settlement or a clarification of the issues. If the staff considers that the complaint is serious enough to be dealt with by a more formal process, then it will refer the matter to the Practice and Ethics Committee for further consideration.

In cases over which Council has no jurisdiction to act (e.g. contractual matters such as fees, extent of services, etc.), the staff may try to arrange a voluntary adjudication between the parties. The Association will provide a standard form contract of agreement to submit to adjudication and the names of suitable adjudicators. All costs of adjudication are borne by the parties themselves and not the Association. Nor does the Association participate in the adjudication itself. In this way, the Association hopes to promote settlement of disagreements without the necessity of the parties commencing expensive and lengthy litigation.

VI.3.3 Informal Investigation by the Practice and Ethics Committee

As we have already pointed out in an earlier section of this paper, the Practice and Ethics Committee is a standing committee of Council. The functions of the Committee generally are to investigate complaints informally, to advise, admonish and correct the behaviour of members, and to make recommendations to Council as to the advisability of instituting formal disciplinary proceedings. The committee is composed of two members of Council and three or more members of the APEO appointed by Council.¹⁶⁴ Its formal terms of reference are as follows:¹⁶⁵

- (a) advise the council on all matters referred to it in connection with the practice and ethics of the profession;
- (b) provide for informal investigation of any and all complaints referred to it or of any matter which it considers likely to affect the ethical practice of the profession;

- (c) provide to the council or to members advice, assistance and interpretation in matters relating to differences, misunderstandings and alleged breaches of the code of ethics; and
- (d) authorize the issuing of letters of warning, correction, advice or admonition, with the objective of forestalling or preventing actions or practices which might lead to formal complaints.

The informal investigations may be conducted by the APEO staff, by individual members of the Committee or by the Committee as a whole. The investigation will often consist of interviewing the parties to the complaint. The Committee has no authority to compel persons to submit to the interview; all information provided is given voluntarily and is held in confidence by the members of the Committee. Before conducting the interview, the Committee warns the parties that any information provided may be used by the Committee to help it decide on further action. The Committee does not keep formal transcripts of its proceedings, but does keep records. Members may not appear with counsel or by agent; they must appear alone.

There are six possible courses of action open to the Committee:

- (i) Advising all parties that the complaint is outside the jurisdiction of the Association.
- (ii) Advising, warning, or admonishing the member against whom the complaint was made;
- (iii) Advising, warning or admonishing the complainant,
- (iv) Advising the complainant that the nature of the complaint is not serious enough to warrant initiation by the Association of formal disciplinary procedures. (In cases such as these the complainant himself may initiate formal disciplinary procedures by making a formal complaint and engaging counsel to prosecute the action at a formal hearing of Council.)

(v) Recommending that Council appoint a special committee of inquiry to investigate technical aspects of the case outside of the competence of the Committee to consider adequately.

(vi) Recommending to Council that the Director of Legal and Professional Affairs make a formal complaint on behalf of the Association and that the Association's solicitors prosecute the action at a formal disciplinary hearing before council.

VI.3.4 The Formal Disciplinary Hearing

In most cases, the formal disciplinary hearing is initiated by a complaint sworn out by a member of the APEO staff (usually the Director of Legal and Professional Affairs) and the action is prosecuted by the Association's solicitors. Prior to the amendments of 1968-69 Council as a whole sat on the hearing. Now section 25(20) enables Council to appoint a Discipline Committee, composed of at least five members of Council, to act on Council's behalf. The provisions of The Professional Engineers Act conform generally to the principles enunciated in the McRuer Report: the "accused" may be represented by counsel; hearings may be held in camera; evidence may be heard from both sides; the rules of evidence used in civil proceedings are used, with some exceptions, etc. The following provisions of The Professional Engineers Act are applicable to disciplinary hearings:

25.(1) Subject to subsection 2, where the council finds that a person who is a member or licensee is guilty of professional misconduct or has obtained registration as a member or has been issued a licence by reason of misrepresentation by such person, the council may by order do one or more of the following:

1. Reprimand such person and, if considered proper, direct that the fact of the reprimand be recorded on the register.

2. Suspend the membership or licence of such person for such time as the council considers proper and direct that the re-instatement of such membership or licence on the termination of such suspension be subject to such conditions, if any, as the council considers proper.
 3. Direct that the imposition of any penalty be suspended or postponed for such period and upon such terms as the council considers proper and that at the end of such period and upon the compliance with such terms any penalty be remitted.
 4. Direct that the membership or licence of such person be cancelled and that the name of such person be removed from the register.
 5. Direct that the decision of the council be published in detail or in summary in the official journal of the Association or in such other manner or medium as the council considers appropriate in any particular case.
 6. Direct that, where it appears that the proceedings were unwarranted, such costs as to the council seem just be paid by the Association to the member or licensee whose conduct was the subject of such proceedings.
- (2) The council shall not take any action under subsection 1 unless,
- (a) a complaint under oath has been filed with the registrar and a copy thereof has been served on the person whose conduct is being investigated;
 - (b) the person whose conduct is being investigated has been served with a notice of the time and place of the hearing; and
 - (c) the council has heard evidence of or on behalf of the complainant and, if the person whose conduct is being investigated appears at the hearing and so requests, has heard his evidence or evidence on his behalf and has reached the decision that he is guilty.
- (3) Any person presiding at a hearing may administer oaths to witnesses and require them to give evidence under oath.
- (4) If the person whose conduct is being investigated fails to appear in answer to the notice at the time and place appointed, the hearing may be conducted in his absence.

(5) Hearings shall be held in camera, but if the person whose conduct is being investigated requests otherwise by a notice in writing delivered to the registrar before the day fixed for the hearing, the council shall conduct the hearing in public or otherwise as it considers proper.

(6) The council may adjourn any hearing at any time and from time to time.

(7) A person whose conduct is being investigated, if present in person at the hearing, has the right to be represented by counsel or agent, to adduce evidence and to make submissions, and any such person may be compelled to attend and give evidence in the manner provided in subsection 10, but such person shall be advised of his right to object to answer any question under section 9 of The Evidence Act and section 5 of The Canada Evidence Act.

(8) The oral evidence submitted at a hearing shall be taken down in writing or by any other method authorized by The Evidence Act.

(9) The rules of evidence applicable in civil proceedings are applicable at hearings, but at a hearing members of the council may take notice of generally recognized technical or scientific facts or opinions within the specialized knowledge of members of the council if the person whose conduct is being investigated has been informed before or during the hearing of any such matters noticed and he has been given an opportunity to contest the material so noticed.

(10) The president, a vice-president, the immediate past president or the registrar may, and the registrar upon application of a person whose conduct is being investigated shall, issue a summons in the form prescribed by regulation, commanding the attendance and examination of any person as a witness, and the production of any document the production of which could be compelled at the trial of an action, to appear before the council at the time and place mentioned in the summons and stating that failure to obey the summons will render the person liable to imprisonment on an application to the Supreme Court, but the person whose attendance is required is entitled to the like conduct money and payment for expenses and loss of time as upon attendance as a witness at a trial in the Supreme Court.

(11) If any person,

(a) on being duly summoned to appear as a witness makes default in attending; or

- (b) being in attendance as a witness refuses to take an oath legally required to be taken, or to produce any document in his power or control legally required to be produced by him, or to answer any question which he is legally required to answer; or
- (c) does any other thing which would, if the council had been a court of law having power to commit for contempt, have been contempt of that court, [sic]

the person presiding at the hearing may certify the offence of that person under his hand to the Supreme Court and the court may thereupon inquire into the alleged offence and after hearing any witnesses who may be produced against or on behalf of the person charged with the offence, and after hearing any statements that may be offered in defence, punish or take steps for the punishment of that person in the like manner as if he had been guilty of contempt of court.

(12) At a hearing the complainant and the person whose conduct is being investigated have the right to examine the witnesses called by them respectively, and to cross-examine the witnesses opposed in interest.

(13) The decision taken after a hearing shall be in writing and shall contain or be accompanied by the reasons for the decision in which are set out the findings of fact and the conclusions of law, if any, based thereon, and a copy of the decision and the reasons therefor, together with a notice to the person whose conduct is being investigated of his right of appeal, shall be served upon him within thirty days after the date of the decision.

(14) A record shall be compiled for every hearing consisting of the complaint and the notice referred to in subsection 2, any intermediate rulings or orders made in the course of the proceedings, a transcript of the oral evidence, if a transcript has been prepared, such documentary evidence and things as were received in evidence and the decision and the reasons therefor, provided that documents and things received in evidence may be released to the persons tendering them when all appeals have been finally disposed of or the right to appeal has terminated.

(15) Any document required to be served under this Act upon a person whose conduct is being investigated shall be served personally upon him, but where it appears that service cannot be effected personally, the document may be served by mailing a copy thereof in a registered letter addressed to him at his last known residence or office address as shown by the records of the Association, and service shall be effected not less than ten days before the date of the hearing or the event or thing required to be done, as the case may be, and proof by affidavit of the service is sufficient.

(16) Where a member or licensee has been suspended from practising under this section, he may, upon payment of all fees and other costs owing by him to the Association, apply to the council to be reinstated as a member or licensee, as the case may be, and the council may terminate the suspension of such member or licensee upon such terms as it considers proper.

(17) A person whose membership or licence has been cancelled under this section may apply to the council for membership or for a licence, as the case may be, and the council shall, subject to subsection 18, hear the application and make such order as it considers proper and may include as a term of any such order such conditions as the council considers proper to be fulfilled before the applicant is admitted to membership or granted a licence or to be observed by such member or licensee thereafter.

(18) Except with the consent of the council, no application under subsection 17 shall be heard before the expiry of two years from the date of cancellation of membership or licence or the date of the final disposition of any appeal.

(19) Upon a hearing for admission to membership or for the granting of a licence under subsection 17, the council shall follow, in so far as practicable, the procedure provided for in the case of a complaint under this section, and a former member or licensee has the same right of appeal from an order made by the council under subsection 17 as is provided in section 26.

(20) The council may appoint a committee to act for and on its behalf composed of not fewer than five members of the council, one of whom shall be the president, a vice-president or the immediate past president, and may delegate to the committee all or any of its powers and duties under this section upon such terms and conditions, if any, as the council considers proper, and a decision or order of the committee is the decision or order of the council.

(21) Except in the case of professional misconduct constituting incompetence on the part of the person whose conduct was investigated, the suspension or cancellation of the membership or licence of a person whose conduct was investigated under this section does not become effective until any appeal has been finally disposed of or the right of appeal has terminated.

APPEAL

26.(1) Any person whom the council has refused to register for membership or whose name the council has refused to restore on the register or to whom the council has refused to issue a licence or who has been reprimanded or whose membership or licence is suspended or cancelled may appeal from the order of refusal, reprimand, suspension or cancellation to the Court of Appeal within fifteen days from the day upon which he is served with the order of refusal, reprimand, suspension or cancellation.

(2) Upon the request of any person desiring to appeal and upon payment of the cost thereof, the registrar shall furnish such person with a certified copy of all proceedings, evidence, reports, orders and papers received as evidence by the council and any committee thereof appointed pursuant to subsection 20 of section 25 in dealing with and disposing of the matter complained of.

(3) If the appellant fails to pay the cost of the certified copy and the cost of such additional copies of the evidence as may be reasonably required for the purposes of the appeal within fifteen days after written demand from the registrar, the appeal shall be deemed to be abandoned.

(4) An appeal under this section shall be by motion, notice of which shall be served upon the registrar, and the record shall consist of a copy, certified by the registrar, of the proceedings before the council or committee thereof, the evidence taken, the report of the council or committee thereof and all decisions, findings and order of the council or committee thereof in the matter.

(5) Upon the hearing of an appeal under this section, the Court of Appeal may make such order as the court considers proper or may refer the matter or any part thereof back to the council with such directions as the court considers proper.

(6) The Court of Appeal may make such order as to the costs of the appeal as the court considers proper.

Pursuant to its powers under s.7(1)(c) to make regulations

"respecting the practice and procedure for hearings held under this Act,"
the Council passed the following regulations (O.Reg.111/71, ss. 1-6.)

PRACTICE AND PROCEDURE FOR HEARINGS

Contents of Complaints and Particulars

1. Every complaint filed under the provisions of subsection 2 of section 25 of the Act shall,
 - (a) contain a concise statement of the facts relevant to the complaint;
 - (b) if professional misconduct is alleged, specify the applicable clauses of sections 8 and 9 of Ontario Regulation 449/69 and any section of the code of ethics relied upon by the complainant;
 - (c) if misrepresentation is alleged, specify the respect in which the complaint is made;
 - (d) be divided into consecutively numbered paragraphs, each of which shall be confined as nearly as may be to a separate and distinct portion of the subject matter of the complaint;
 - (e) be endorsed with the name and address of the complainant or the complainant's solicitor to whom communications may be sent.
2. The person whose conduct is being investigated may by a demand for particulars served upon the complainant and the registrar require the complainant to deliver such further and better particulars of the complaint as may be set forth in the demand for particulars.
3. If the complainant has not served a reply to the demand for particulars served under section 2 not less than ten days prior to the date of the hearing, the person whose conduct is being investigated may apply at the commencement of the hearing for directions for particulars.
4. Upon any application pursuant to section 3 or upon its own motion, the council may dismiss the complaint for lack of particularity or may direct the complainant to furnish such further and better particulars as in the opinion of the council may be required for the purposes of the hearing and may adjourn the hearing until such time as such particulars are delivered.
5. If the complainant fails to comply with a direction for further and better particulars, the person whose conduct is being investigated may, after giving proper notice to the complainant, apply to the council for the dismissal of the complaint against him.

6. Particulars delivered pursuant to a demand for particulars under section 2 or a direction of the council under section 4 shall form part of the complaint and shall be included in the record of the hearing.
O.Reg.111/71, s.6.

VI.3.5 Public Access to Information

Except for a brief pamphlet on professional ethics the Association has no comprehensive guide to inform either the profession or the public about the professional and ethical duties of the engineer. The Council, however, does publish the facts and findings of disciplinary hearings in its publication, the Ontario Digest. This is one of the sanctions made available to the Council in section 25(1) of The Professional Engineers Act. In the past, the facts were published without disclosing the names of those involved. Due to pressure from its membership, it is now very common practice (with a few exceptions) to publish the names of the parties.

VI.3.6 Bibliography

The following publications may be of use to researchers concerned with the ethical and professional duties of professional engineers:

"Ethical Standards and Professional Conduct," The Annals of the American Academy of Political and Social Science, January 1955.

Murray I. Mantel, Ethics and Professionalism in Engineering, (MacMillan & Company, New York, 1964).

John Dustin Kemper, The Engineer and His Profession, (Holt, Rinehart & Winston, New York, 1967).

FOOTNOTES

1. Much of the legislative history that follows has been drawn from two sources: J. Clark Keith, A Brief History of Legislation pertaining to the Association of Professional Engineers of the Province of Ontario, (monograph issued by the Association of Professional Engineers of the Province of Ontario, 1939); and J.B. Wallace, The History and Times of the Association of Professional Engineers of Ontario 1922-1957, (monograph of the Association of Professional Engineers of Ontario).
2. The Engineering Institute of Canada is described in more detail, infra, Section II.4.1.
3. The Professional Engineers Act, S.O. 1922, c.59, s.18.
4. See The Professional Engineers Act, R.S.O. 1937, c.237, s.2(e).
5. The Professional Engineers Amendment Act, S.O. 1937, c.98, s.9.
6. S.O. 1946, c.75.
7. S.O. 1947, c.80.
8. S.O. 1949, c.76.
9. S.O. 1952, c.79.
10. S.O. 1954, c.73.
11. The Professional Engineers Act, S.O. 1968-69, c.99, s.3(3).
12. Ibid., s.7.
13. Ibid., s.8.
14. Ibid., s.20. Certificates of authorization will be discussed in more detail infra, Section III.3.
15. Government of Ontario. Royal Commission on the Inquiry into Civil Rights. Report, No. 1, Vol. 3 (Ontario: Queen's Printer, 1968) pp. 1181-1203.
16. Ibid., s.24(1).
17. Ibid., s.25.
18. Ibid., s.26.
19. S.O. 1968-69, c.99, s.3.
20. The Professional Engineers Act, R.S.O. 1970, c.366, s.3(1).

21. s.8(1)(n).
22. s.8(1)(o).
23. s.24(1).
24. s.19.
25. s.3.
26. s.4.
27. s.7(1)(a) and s.11(1)(c).
28. s.7(1)(h).
29. O. Reg. 59/73, ss.1-13.
30. O. Reg. 60/73, ss.1-14.
31. s.8(1)(k). The APEO system of awards and scholarships is outlined in a brochure put out by the Awards Committee of the APEO.
32. s.8(1)(p). Continuing education is discussed infra, Section IV.6.
33. s.7(1)(c).
34. s.7(1)(d).
35. s.4(5).
36. The only exception, in this regard, seems to be the Disciplinary Committee, which may assume all powers and duties of the Council to hold disciplinary hearings: The Professional Engineers Act, R.S.O. 1970, c.366, s.25(2). See infra, Section VI.
37. See APEO By-law No. 1, ss.82-92 for the composition and functions of the standing committees.
38. Op.cit., n.31.
39. Letters Patent Incorporating the Canadian Council of Professional Engineers, January 14, 1964, pp.2-3.
40. CCPE, By-law No. 1, s.E4.
41. Ibid., s.E20.
42. Ibid., s.E21.
43. Ibid., s.E22.
44. Engineering Manpower Council, "Constitution," s. 4.

45. The ACEC will be described in more detail infra, Section II.3.1(b).
46. See "Consulting Engineers of Ontario proposed Committee organization and terms of reference," draft June 2, 1976.
47. By-laws, Consulting Engineers of Ontario, April 1975, Article ii.
48. Charter, Association of Consulting Engineers of Canada, p.2.
49. "Annual Report of the Task Committee on Project Management," A.C.E.C. Annual Report, 1975-76.
50. "Annual Report of the Export of Engineering Services Committee, 1975-76," A.C.E.C. Annual Report, 1975-76.
51. Ibid.
52. Ibid.
53. The role of engineering technicians and technologists will be discussed in more detail infra, Section V.3.4. It should be noted here, however, that the difference between the terms "engineering technician" and "engineering technologist" is one based upon educational qualifications: the technician generally has completed a two-year diploma course at one of the Colleges of Applied Arts and Technology, while the technologist has completed a three-year course.
54. Letters Patent of the Ontario Association of Engineering Technicians and Technologists, March 19, 1962.
55. Ibid.
56. The Engineering Technologist, study for the Ministry of Colleges and Universities of the Province of Ontario, prepared by Goodings, Sidlofsky, Goodings and Associates Limited, 1975, pp.108-109.
57. Ibid.
58. OACETT By-law Number 15, s.3.
59. Registration and Membership, OACETT brochure, 1975, p. 6.
60. OACETT Registration Board Policy and Procedure Manual, Section C, September 10, 1976.
61. Ibid.
62. Ibid., s. E.
63. Ibid.
64. OACETT By-law Number 15, s. 48.

65. OACETT Accreditation Board Policy, ss. 3.2 and 3.3.
66. OACETT Registration Board Policy and Procedure Manual, s. b.1.
67. Ibid.
68. OACETT By-law Number 15, s.12.
69. CCA Constitution and By-laws.
70. See Section III.3, infra.
71. Byron T. Kerr, "The EIC on the Move," Engineering Journal, September 1973, Volume 56/9, p.8.
72. The Labour Relations Act, R.S.O. 1970, c.232, s.6(3).
73. Task Force on Labour Relations, Study No. 2, (Ottawa, 1968) pp. 208-247.
74. Quoted in Goldenberg, Professional Workers and Collective Bargaining, op.cit., pp.226-227.
75. APEO By-law Number 1, s.91.
76. Labour Relations Amendment Act, S.O. 1970, c.85, s.4(2); now R.S.O. 1970, c.232, s.6(3).
77. See letter to Professional Organizations Committee from Ministry of Labour, August 19, 1976.
78. S.O. 1937, c.98.
79. The Professional Engineers Act, R.S.O. 1970, c. 366, s. 27(1).
80. Ibid., s.27(3).
81. Ibid., s.27(1).
82. Ibid., s.3(3).
83. See First Annual Report of the Canadian Accreditation Board, p.7.
84. Ibid.
85. Report of the Board of Examiners, Board of Examiners Minutes, May 4, 1973, see Registrar's Reference Papers, section 3.
86. Ibid.
87. R.R.O. 1970, Reg. 691, as amended by O. Reg. 111/ 71.
88. The Professional Engineers Act, R.S.O. c.366, s.17(3).

89. APEO Council Minute 6726, 1976.
90. See "Licences Connected with The Boilers and Pressure Vessels Act of the Province of Ontario," a submission to the Members of Council of the APEO, C.A. Campbell, P. Eng., President.
91. R.S.O. 1970, c.47, as amended by S.O. 1972, c.31.
92. Ibid., s.14(1)(a).
93. S.O. 1972, c.31, ss.1 and 2.
94. APEO Code of Ethics, s.6(b).
95. O. Reg. 59/73, ss.1-13.
96. O. Reg. 60/73.
97. Taken from P.A. Lapp, Ring of Iron, op.cit., p.67.
98. From P.A. Lapp, Undergraduate Engineering Enrolment Projections for Ontario, 1970-80, op.cit., p.3.
99. Extracted from Canadian Council of Professional Engineers, "Registration in Engineering at Canadian Universities," Engineering Manpower News, Number 7, January 1976.
100. Ring of Iron, op.cit., at p.39.
101. P.A. Lapp, Ring of Iron, op.cit., p.66.
102. Ibid., at pp.72-83.
103. Section III. Qualifications and Entry into the Profession, supra.
104. APEO By-law No. 1, s.88(d).
105. Ibid., pp.7-10.
106. 1968 Membership Survey, Association of Professional Engineers of Ontario, pp.5-6. The Ring of Iron provides a fairly useful (but somewhat dated) analysis of the characteristics of engineering manpower in Canada. See Lapp, Hodgins, Mackay, Ring of Iron, op.cit., pp.44-51. The Practice of Consulting Engineering describes in detail the work of consulting engineers in private practice. Reference should also be made to M.L. Skolnick, "An Analysis of Projections of the Demand for Engineers in Canada and Ontario," CPUO Report No. 70-2, November 1970.
107. The Professional Engineers Act, R.S.O. 1970, c.366, s.1(i).
108. Ibid., s. 27.

109. The principles supported by the APEO have been enunciated in a number of documents, including the Association's brief to the Law Reform Commission, October 26, 1976 and the President's letter to the Honourable Dalton Bales dated September 17, 1973.
110. See supra, s. V.2.
111. See supra Section V.3.2.
112. R.S.O. 1970, c.27.
113. Ibid., ss.16(1) and 16(2).
114. Ibid., s.16(3) [emphasis added].
115. [1955] O.W.N. 705.
116. Ibid., p.707.
117. Ibid., p.708.
118. [1973] 4 O.R. (2d) 119.
119. Ibid., pp. 128-129.
120. [1976] 11 O.R. (2d) 280.
121. Ibid., p.285.
122. Ibid., p.287. An appeal was lodged on this decision but dropped after the decision of the Divisional Court in OAA v. B.H. Marton Consultants Ltd., [1976] 14 O.R. (2d) 399 (S.C.O.), dismissing a prosecution by the OAA of an engineering firm for unauthorized practice. It should also be noted that permission for leave to appeal the Martin decision was denied by the Court of Appeal.
123. The Professional Engineers Act, R.S.O. 1970, c. 366, s. 2(b) and The Architects Act, R.S.O. 1970, c. , s. 18(4)(b).
124. Proposed Architects Act, 1973, s.15.
125. Letter from Messrs. McCarthy and McCarthy to C.J. Moull, President of the APEO, September 14, 1973, p.4.
126. Joint Committee APEO/OAA Interim Statement.
127. The reader is also referred to Section II.3.3, supra, Paraprofessionals: Ontario Association of Engineering Technicians and Technologists.
128. The Engineering Technologist, A Study for the Ministry of Colleges and Universities of the Province of Ontario, prepared by Goodings, Sidlofsky, Goodings and Associated Limited, 1975, pp.71-74.

129. Ibid.
130. Loss Control Bulletins, National Program Administrator RAIC & Canadian Engineers Professional Liability Insurance Programs, Bulletin No. 22.
131. APEO By-law No. 1, s.89.
132. "Scale of Fees and Guide for the Engagement of Consulting Engineering Services - General Engineering Projects," APEO, 1970.
133. Outlined supra in Section V.6.2.
134. The Combines Investigation Act, supra, s.32(6).
135. Discussed supra, Section II.3.1(c).
136. The Canadian Council of Professional Engineers Brief presented to The Committee on Finance, Trade and Economic Affairs, on Bill C-2 - Combines Investigation Act, December 10, 1974.
The Canadian Council of Professional Engineers, Brief presented to the Honourable Herb Gray, Minister of Consumer and Corporate Affairs, or Bill C-2 - Combines Investigation Act, January 25, 1974.
137. Brief to the Honourable Herb Gray, op. cit., p. 4.
138. The following information is summarized from the Practice of Consulting Engineering, published by the Association of Consulting Engineers of Canada, 1976, pp.4.14-4.22.
139. From The Practice of Professional Engineering, The Association of Consulting Engineers of Canada, 1976, pp.4.14-4.15.
140. The Practice of Consulting Engineers, the Association of Consulting Engineers of Canada, 1976, p.4.1.
141. O. Reg. 60/73, s.7.
142. See Macklem and Bristow, Mechanics' Lien in Canada, 3d edition, (The Carswell Co. Ltd., Toronto, 1972).
143. R.S.C. 1970, c.C-34, as amended in R.S.C. 1970, c.11, 44 (first supp.), p.1606.
144. For a more detailed analysis of contract law as it applies to engineering see Laidlaw, Young, and Dick, Engineering Law fifth edition (University of Toronto Press, 1961, Toronto) chapters II-VII.
145. Loss Control Bulletins, the National Programme Administrator R.A.I.C. Canadian Engineers Professional Liability Insurance Programmes, Bulletin Number 9.

146. Ibid., Bulletin Number 13.
147. Ibid., Bulletin Number 14.
148. Ibid.
149. Ibid., ss.2.3.1, 2.3.2, and 2.4.
150. Loss Control Bulletins, supra no. 218; Bulletin No. 7.
151. Ibid., Bulletin Numbers 3 and 16.
152. Ibid., Bulletin Number 6.
153. Ibid., Bulletin Numbers 8, 15, 17, 27.
154. Ibid., Bulletin Number 10.
155. Ibid., Bulletin Numbers 24 and 25.
156. Ibid., Bulletin Number 19.
157. Loss Control Bulletins, op.cit., Bulletin No. 2. See also Bulletin Numbers 4, 5, 11 and 22.
158. The Professional Engineers Act, R.S.O. 1970, c.366, s.25(1).
159. Ibid., s. 7(1)(d)
160. R.R.O. 1970, Reg.691, ss. 8 and 9.
161. O. Reg. 59/73, s.8.
162. O. Reg. 60/73, s.7.
163. S.O. 1947, c.80, s.1.
164. By-law No. 1, s.84(c).
165. Ibid., s. 87.

